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Training of School Teachers of the North Eastern Region

In Satellite as well as Face-to-Face modes, to be conducted by
NERIE (NCERT) - Shillong

A Composite Plan (as revised on 07.07.2007)

Background papers:

1. Earlier version of this report (23 Jan. 2007)
2. NERIE's (NCERT) proposal to NEC (2006)
3. Letters from Sh.P.P.Srivastav, Hon'ble member-NEC dt. 05.05.2007 and 04.06.2007

by

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07.07.2007

NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING
SRI AUROBINDO MARG, NEW DELHI-110016

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विद्ययाऽमृतमश्नुते
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Preface:

This is the fourth Report in this project. The first Report (September-2006) was on my very first on-the-spot findings. The second Report (December 2006) was mainly on the interactions with the school teachers attending the 5-day teachers' training programme conducted by me and NERIE faculty at the NERIE- Shillong during 4-8 December, 2006. This training programme gave us many insights - what the teacher actually needs, design and schedule of the program to draw out the best out of the teacher, how to make the programme totally interactive , how to create a situation where the teacher starts coining problem solving and critcal thinking questions. The hardworking faculty of NERIE , while hosting this training programme , brought local educational adminstrators, NEHU faculty, the NIE- New Delhi and teachers closer.

The third Report "Training of School Teachers of the North East Region in Satellite and face-to-face modes - a Plan" was submitted on 23 January 2007. The report was circulated to all concerned and discussed with Director-NCERT, Joint Director-NCERT, Principal and faculty of NERIE-Shillong, Director NESAC, deptt. of Space, GOI, Umlam, Shillong. These discussions exposed many information gaps which demanded fine tuning of the January (2007) Report. Earlier NEC requested NERIE to submit a project Proposal "Training of elementary level teachers (Class I-VIII) of NE Region on Science and Mathmatics". This Proposal submitted by NERIE in 2006 has now been discussed with NERIE faculty before merging it with the plan contained in this Report (July-2007).

This Report has been written wth the sole objective to arrive at a realistic Workplan and Budget for starting Teachers' Training in Satellite and Face-to-Face modes in the North East. The NCERT additionally asked me to "develop an Educational Technology Cell in NERIE..NEC is willing to fund the setting up of an SIET/Educational Technology Cell at Shillong.". Accordingly a detailed Plan of the ET Cell along with financial estimates have been presented in this Report.

I thank all concerned for giving comments and helping me to make this Report finetuned to the ground realities.

— P K BHATTACHARYYA
Professor - NIE
NCERT, New Delhi- 110016
07.07.2007

0. Terms of Reference

0.1 The terms of reference as elaborated by the Director – NCERT are as follows: There is much enthusiasm about distance education in North East but little data and their objective analysis are available, based upon which a viable plan could be evolved. Almost nothing is known about the readiness of different institution, including NERIE Shillong and State agencies like SCERTs/SIEs who are expected to play major roles in distance education programmes. A sound knowledge about the specific needs of the region in general and of different stake holders in particular and responses of people who will be able to handle such a programme or several such programmes would constitute basic data upon which a plans needs to be developed. The programme has to be specific for teachers of particular grade levels.

There is no data on the basic qualification of teachers or respective number of teachers at various grades, nor on specific areas in which in- service programme may be organized. Demand for pre-service courses vis-à-vis the access available to the traditional system needs to be examined closely.

All these calls for visit to the region, holding meetings of heads of institutions and thorough study of education on the ground. Based upon the overall responses of institutions and their faculty and the available infrastructure facility, a tentative budgetary plan is also to be developed. A comprehensive plan for the region with all these details and a sound analysis of data collected from the region would be our first step…

0.2 The followings are quoted from the statement of the Ministry of Human Resource Development, Govt. of India on 5 th September, 2006 on the occasion of TEACHERS' DAY……NCF-2005 proposes five guiding principles for curriculum development:

(i) Connecting knowledge to life outside the school.
(ii) Ensuring that learning shifts away from rote methods;
(iii) Enriching the curriculum so that it goes beyond textbooks;
(iv) Making examinations more flexible and integrating them with classroom life; and
(v) Nurturing an overriding identity informed by caring concerns within the democratic polity of the country. …

….With little effort to link pre-service and in-service teacher education, the real needs of school teachers remain unaddressed to this date. School teachers, in particular, those in elementary schools continue to remain severed from centers of higher learning and are intellectually isolated.

The design and practice of current teacher education programmes is based on certain assumptions, which impede the progress of ideas and the professional and personal growth of the teacher. It is assumed for instance, that disciplinary knowledge is 'given', which the trainees 'acquire' through general education and which is independent of professional training in pedagogy….

0.3 New visualized TEP (Teacher Education Programme):

- Emphasizes learning as a self-learning participatory process taking place in social context of learners as well as wider social context of the community to nation as a whole.
- Puts full faith in self learning capacity of school children and student teacher and evolving proper educative programme for education.
- Views the learner as an active participative person in learning. His/her capabilities or potentials are seen not as fixed but capable of development through experiences.
- Views the teacher as a facilitator, supporting, encouraging learner's learning.
- Does not treat knowledge as fixed, static or confined in books but as something being constructed through various types of experiences. It is created through discussion, evaluate, explain, compare and contrasts i.e., through interaction.
- Emphasizes that appraisal in such an educative process will be continuous, will be self-appraisal, will be peer appraisal, will be done by teacher educators, and formal type too. One can visualize from foregoing very brief presentation that
- New TEP can not be a fixed programme (curriculum), i.e., it is not predetermined.
- Methods are not fixed.
- The learner's will decide about all the aspects of learning.
- There will be different learning modes and routes depending on learner's nature. Still however, some basic broad outline of –
    - ➢ What types of individual or group field experiences need to be provided will be thought of.
    - ➢ What types of guidance, encouragement, support will be needed (may take another form) and how they can be provided can be thought of.

- Which types of resource facilities will be needed in self-learning process like library, ET Tools, ICT Services etc. may be articulated.
- Forming the group of motivated people who are interested to experiment with and who are ready to take trouble to implement such TEP will be considered.

We can make a long list of such predetermined, but not prescriptive aspects of new TEP. Details can be worked out at the time of implementation.

1. The Eight Sisters

1.1 General Features of the North-East

India's North East comprises of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and Sikkim. The region shares 98% of India's border with neighbouring countries. This region is connected to the rest of India through a 22 – km corridor through Siliguri (West Bengal).This is also called chicken's neck or Siliguri neck. **The eight states that comprise the region reflect ecological and cultural contrasts between the hills and the plains;** there are also significant elements of continuity. Available medieval and modern records indicate interdependence and interaction between the hills and plains. **The North East is one of the most biodiverse regions in the world**. The forest cover varies but averages at 65 per cent. The area can be divided into three geographical divisions-the Shillong Plateau, the North Eastern hill Basin and the Brahmaputra Valley.

The region has an area of 2,62,500 sq.km, population of 39.04 million which is 3.80% of Indian population. Assam accounts for 70% of population of this region.

Agriculture:

The pattern of agricultural growth has however remained uneven across regions and crops. **The NER continues to be a net importer of food grains** even for its own consumption. In spite of covering 7.7% of the country's total geographical area, NER produces only 1.5% of the country's total food grain production. **Agriculture provides livelihood support to 70 % of the population of NER.**

Irrigation:

The NER has considerable unexploited irrigation potential, especially in states like, the Imphal valley in Manipur and in Tripura. Till recently, about 19% of the total potential of 5.7 lakh ha. Could be exploited in Assam, against the national achievement of 40% .So far, Manipur could attain the level of about 10% of the total potential to cover 65000 ha. The potential in Tripura for irrigation has been assessed at 2.81 lakh ha. The topographical conditions in Mizoram, Meghalaya, Nagaland, and Sikkim are not favourable for groundwater irrigation schemes and therefore the development of surface irrigation has better prospects

Industry:

Industrially, the NER **continues to be the most backward region in the country,** and the states in the region hardly have any industrial base, except perhaps Assam, because of its traditional tea, oil and wood based industries .To some extent Meghalaya has made some headway in setting up of small and medium industries. There are a number of factors contributing to the lack of industrial growth in the region like poor infrastructure, inadequate supply of electricity, violence and extortion etc.The growth of all industries; large, medium and small has been uneven. The no. of functioning large and medium industries in the NER has been negligible . The status of industries in the NER is as follows:

Small Scale Industries:

Results of the third census of SSIs units reveal that while 3.11% of the total no. of persons employed in the SSI sector in the country, were employed in the NER, percentage of output in NER is not in tune with the no. of units and the no. of persons employed. It is also observed in that of 3% of the total SSI units which exist in NER and which, provided around 3% of the total employment produced goods and services equivalent to 1.78% only.

Food Processing Industries:

NER, by virtue of its diverse agro-climatic conditions, varied soil type and abundant rainfall has the promises of becoming an excellent sourcing point for high value horticultural produce and value added products unique to the region, for onward marketing both within the country and abroad.

Khadi and Village Industry (KVI):

For providing employment opportunities in rural areas and thereby strengthening the rural economy, KVI plays an important role .In order to have better implementation and monitoring of KVI programmes in NER, a zonal office of KVIC has also been set up in Guwahati.

Tea Industry:

The tea industry of NER is the world's largest tea growing region having 16 % share, and is the largest producer and exporter of tea in India (share 55 %).

: Tea Industry of the NER (830 million kg production)

Education:

Access to educational institutions promoting skill development is a prerequisite for providing trained manpower. As per 1991 census literacy rate of NER was 58.09%, while in 2001 it was 68.5%.

Natural Resources:

NER is endowed with rich natural resources:

Agro-Forestry:

- Accounts for 26 % of the Forest cover of India.
- **Largest producer of bamboo.**
- **World's Single largest Tea growing region (16% share).**
- Largest producer (share of 55%) and Exporter of Tea in India
- Producer of premium quality Jute and silk.
- Horticulture and herbal resources.
- Minerals
- India's oldest and major Petroleum and Natural Gas Source, with shares of 16% and 8% respectively of total production.Other major Mineral Resources include: Coal, Limestone, Dolomite.

Hydel Power

The region is assessed to have the largest hydel power generation potential in the country (60,000 MW)

River/ Waterways

The river network provides cost effective transport for movement of goods, notably to neighbouring countries and to Indian ports like Kolkata, & Haldia.

Sectoral Share of GDP

The share of the Secondary sector in the GDP at 15% is much lower than the national average of 23.7% [1999-2000].

Population and employment

- All the states in NER has **much higher levels of population below poverty line** [35.13%] as compared to the national average (26.1%) [2000-01].gf
- The **share of urban population to total in the NER is 14.6%.** The national average in this regard is 27.8% [2001 Census].
- The region represents **one of the highest rates of unemployment in the country**, with an unemployment rate close to 12%, against the national average of 7.7% [1999-00].
- The region has one of the lowest gross per capita industrial output at around Rs. 3313, (in Assam) which is much below the national average of Rs. 9111 [2000-01].
- The average per capita domestic electricity consumption in the NER works out to 20.4 kwh, against the national average of 75.2 kwh. [1999-00].
- Per capita Credit-Deposit ratio works out to 35% in the NER, against the national average of 66% [2004-05].
- The **average per capita income of the region is Rs. 12,918 which is lower than** the national average of Rs. 17,823 (2001-02). It also ranks far below the indices of national average in power, road length, hospital beds, etc. Its literacy levels are higher than the national average. **The UPA Govt's CMP (Common Minimum Programme) calls for providing basic minimum services, improving infrastructure, creating investor-friendly environment.**

Library

1.2 Diversities in the Region

1.2.1 Arunachal Pradesh

Arunachal Pradesh: is the "land of the dawn-lit mountains and of the rising sun'. It has centuries-old Buddhist monasteries and nunneries, treasure trove of scenic locales and legends. Among various states of NER of India, the geographical area of Arunachal Pradesh is highest at 83,743 sq.km. In the economy of Arunachal Pradesh, structural transformation is a recent phenomenon. At the time of independence, this state lagged behind the other parts of the country in terms of development indices. The economy of the state was a mono-economy characterized by traditional slash-and-burn method of agriculture and few small and cottage industries. But since independence, economic development along with government sponsored urbanisation has brought about significant changes in the structure of the economy.

Education: As per the census of 2001, the literacy rate of Arunachal Pradesh was 44.71% . Out of this 52.68% are male and 35.85% are female. Following tables show the status of education in Arunachal Pradesh.

No. of recognized educational institutions in Arunachal Pradesh as on 31-03-2002.

Type	No. of Govt. Insts	No. of Pvt. Insts	Total
Universities	1	-	1
Arts and Science College	7	-	7
Engineering/Technical ints.	-	1	1
H.S. School	57	14	71
Secondary School	92	28	120
Middle School	296	51	347
Primary School	1240	75	1315
Total	1693	169	1862

Source: Statistical abstract of Arunachal Pradesh, 2002.

Teacher – Pupil Ratio :

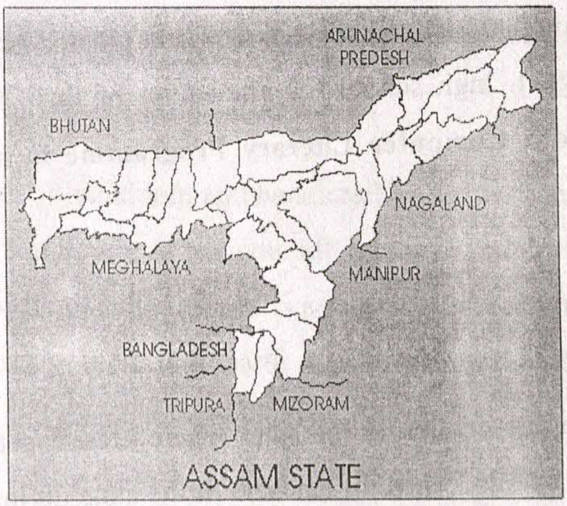
Primary- 1:34 , Middle - 1:28, Secondary-1:26, Higher secondary- 1:30,

College- 1:30 , Universities - 1:7.3

Source: Statistical abstract of Arunachal Pradesh, 2002.

Industrially: Arunachal Pradesh is a backward state. Not only Arunachal Pradesh, but the other states of NER except Assam and to some extent Meghalaya have failed to gear up industrial development in their states.

1.2.2 Assam



Geographically, **Assam** is surrounded by Bhutan and Arunachal Pradesh on the North, Nagaland and Manipur on the East, Meghalalya and Mizoram on the South and Bangladesh, Tripura and West Bengal on the West. Since independence many changes have taken place in Assam geographically and in many other respects. At present, total land area of the is 78, 523 sq. kms. It accounts 2.4% of the total geographical area of the country. Demographically, Assam is the most populous state in the North East India. Economically, **out of the eight North East States, Assam is the most developed. But compared to other states like Maharashtra, Tamilnadu, Gujarat, Assam lags far behind in almost all economic spheres.**

Primary Education:

For achieving universal elementary education, Sarva Siksha Abhijan (SSA) and other schemes have been started. Some of the important indicators of elementary education are stated below:

Total population (2001 census) : 2,66,55,528 ,Children population 5-13 years : 52,37,964

Children enrolled in schools : 46,28,181,Children out of school : 4,24,845

Average teacher per school:-

Lower Primary : 3, Upper Primary : 7

Till 2004, Assam has 30068 primary schools and 7704 upper primary schools. Secondary and Higher Secondary education: As on 2004, Assam has 3719 secondary schools and 788 higher secondary schools. During 2003-04, the state government granted an amount of Rs.5 lakh per schools to 20 nos. of govt. high school for renovation of their building. **The state also introduced Rajiv Gandhi Computer Literary Programme in some higher secondary schools**.

Higher Education:

At present there are five universities in the state. There are altogether 363 institutions for higher education serving by 12425 nos. of teachers in the state during 2002-03. Out of these institutions there are only four govt. colleges.

Agriculture:

Agriculture is the mainstay of a large majority of the population of Assam. As per 2001 census, **53% of total work force are engaged in agricultural activities**. The contribution of agriculture to Net State Domestic Product of the state is 31.19% in 2003-04.The agriculture in the state mostly depends on rainfall. One of the most serious problems adversely affecting the state's agriculture is the recurrence of devastating floods almost every year.

Industry:

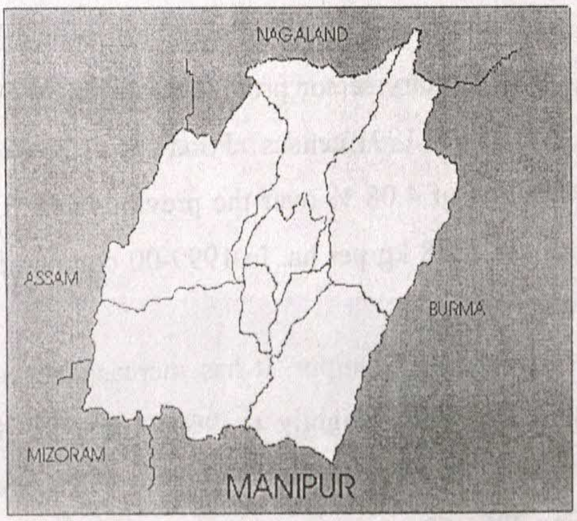
Assam continues to make efforts for gearing up industrial activities with a view to create a strong industrial base in the state. The index of industrial production in the state moved to 141.45 in 2003-04 from 132.37 in 2002-03. Yet the performance of manufacturing and processing sector of the state has not been much encouraging. Besides, Small Scale Industries (SSI) play a vital role in the economy of the state. There are 46,496 SSI units in Assam employing about 2 lakh persons till the year 2003.

The number of registered factories is also increasing but at a slow rate. Handloom is the traditional and labour intensive sector of Assam. The Directorate of Handloom and Textile is looking the activities of this sector. There are 55 numbers of Khadi production centres, 57 numbers of sub-khadi production centres in the State. Such industries are producing yarn, cloth, soaps, honey etc. Its achievement is shown below.

Handicrafts:

Assam has its own basket of handloom and handicraft products, which has own reputation in the world market. But handloom and handicraft sector in India as a whole is lagging in efficient appropriation of its potentiality and is struggling to reach the production and export possibility frontier. Secondly, there is a dearth of information flow among the participants in the market of handloom and handicrafts products.

Manipur



Manipur: is the land of blue green hills, cascading rapids, carpets of flowers, winding rivers, orchids. Tripura, one of the tiniest state in India has rih forest resources, hand woven cotton fabrics with tribal motifs, word carvings, decorative articles from bamboo, cane furniture and exquisitive handicrafts Manipur is a land – locked isolated , hilly state having a geographically distinct identity. It is situated in the eastern most part of Northeastern India. The state is almost rectangular in shape . It covers an area of 22327 sq. km . The climate of the state has distinct winter , warm humid and rainy seasons. Manipur has two important rivers viz. the Imphal river and the Barak river . The Loktak lake of Manipur is the biggest fresh water lake in the NER of India .

Education in Manipur:

In Manipur , the primary stage of education is from Class 1-5 and upper primary stage is Class 6-7. The secondary education is from Class 9-10. Number of Educational Institutions in Manipur for the year 2002 :

University-2, Engineering College-1, Medical College-1, Agricultural College-1, Higher Secondary Schools-659, High Schools-796, Primary Schools- 2573 , Polytechnics- 1

Agriculture in Manipur:

The economy of Manipur, like other northeastern states of India , is mainly dependent on agriculture.**The majority of the population of the state get there means of livelihood from the agricultural sector as they have accepted agriculture as the primary occupation** . As per 2000-01 statistics , agriculture and its allied activities contributed 33 % to Manipur's NSDP at current prices . The primary sector provides upto 69 % of the employment to the entire workforce of the state as per 1991 census . Food grains production was 3.76 lakh MT in 1999-00 registering a decline of 4.08 % over the previous year's production of 3.92 lakh MT. The food grain yield was 2238 kg per ha. In 1999-00 compared to the national average of 1700 kg per ha. The same year.

In case of *tea production* in Manipur, it has increased from 76000 kgs in 1998 to 97000 kgs in 1999 but it decreased slightly to 96000 kgs in 2000. In case of rubber production, it increased from 115 tonnes during 1999-00 to 198 tonnes during 2000-01 and it remained unchanged during 2001-02.

Handicrafts in Manipur:

The major crafts in Manipur are cane and bamboo , woodcraft , brass and bell metal , woolen shoe craft , hand block printing , kauna crafts , hand embroidery, toys and dolls etc.

No. of Artisans : Total:3.80 lakhs : Male : 1.85 lakhs: Female : 1.94 lakhs.

Industry in Manipur:

Of the few public sector enterprises the state has got ,some have been busted , some are incurring losses and some are absolutely non-functional . There has been no value addition from these enterprises for quite many years.Whatever secondary sector is observed in the state are non – agricultural activities of very low scale.

That the **non – agricultural activities in the state have remained more or less a household level of enterprise** rather than evolving into a full scale industrialization process. This is evident from the comparison of the number of persons employed per establishment, which was 5.63 in 1977 and in the Fourth Economic Census in 1998, it remains around the same level at 5.79.

Health Services:

As per the National Human Development Report , 2001 , Manipur has the distinction of having the lowest infant mortality rate in the country

This is due to better availability and a more equitable distribution of health services in comparison to the rest of the country . Although the health department has been able to establish the required number of health institutions, wide infrastructure gaps still exists in the area of building equipment and manpower .The emphasis is now to raise the level of performance of the already established functionaries by providing the necessary infrastructures.

1.2.3 Meghalaya

The hilly state of **Meghalaya** has been called 'a patch of beauty and grace' and is famed as 'the Scotland of the East'. It is linked to the Borail Range, an offshoot of the Himalayan Mountains. The refreshing mountain air, the whispering pines, the exotic flora and fauna, the caves – give the tourist the taste of beauty. Here's Nature in all its glory. Limpid lakes, expansive rivers, babbling streams breaking into waterfalls, twisting and turning, disappearing in the jungle.Meghalaya has a total geographical area of 22,429 sq. km. It is the third largest State in the North East in terms of geographical area. The State has vast natural resources of coal, limestone, kaolin, granite etc. The Khasis, the Jaintias and the Garos form the major ethnic groups of original inhabitants of the State.

Education: occupies an important position in the planned programmes of the Meghalaya Government. The North Eastern Hill University (NEHU) is the only university in the State under the direct responsibility of the Union Government. The State is not having any medical or engineering colleges but only one polytechnic at Shillong. There were 4,235 institutions at the level of primary and junior basic in 1991-92 and in 1998-99 it has gone up to 4,679. With the growth of this primary and junior basic schools, the enrolment at the level of these institutions has also increased by 47.26% between 1981-82 to 1991-92. According to the latest data, such enrolment in these institutions has gone up to 4,02,349 students. The number of middle and senior basic schools, which were 493 in 1981-82 went up to 946 in 1998-99. The high schools including higher secondary institutions recorded 493 in 1998-99. The number of colleges accounted to 33 in 1998-99.

Agriculture and Allied Activities:

Agriculture plays an important role in the State's economy and employs more than fifty percent of the total workforce of the State. It contributes nearly 30% to the State's NSDP in 1999-00. Agriculture not only supplies raw materials for industries outside the State such as cotton, jute, ginger etc. but also provides inputs to other few small agro-based industries in the State such as turmeric, paddy, maize, etc.

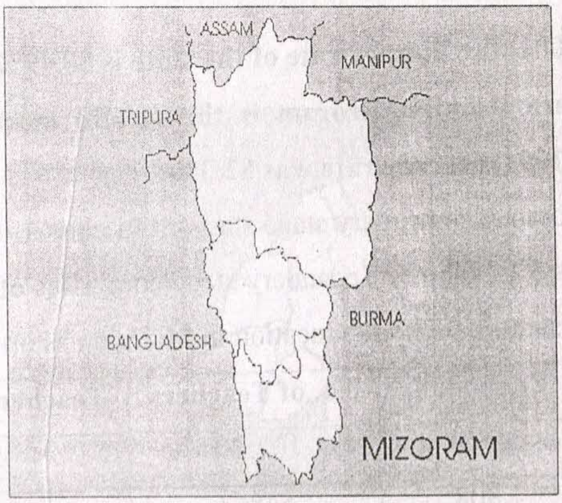
Production of cereals and pulses in Meghalaya:

Production of principal crops like rice and maize, is on the increasing trend. Rice production increased from 170733 m.t. in 1999-00 to 179042 m.t. in 2000-01. Maize production also increased from 24051 m.t. in 1999-00 to 24250 m.t. in 2000-01. Production of other pulses had also increased in production from 1999-00 to 2000-01.

Industrial structure in Meghalaya:

Industries have been classified into two groups, viz., registered manufacturing industries and unregistered manufacturing industries. In both these counts, **Meghalaya can be identified as one of the industrially backward states in the country.** The years 2000 and 2001 have shown that the registered industrial units dropped down to 31 and this is mainly due to the fact that most of these forest based industrial units had to be closed down in view of the ban imposed by the Supreme Court of India.

1.2.5 Mizoram



Blue mountains, deep, narrow valleys, the gentle gurgle of streams, cascading waterfalls in lush tropical forests, a gorgeous array of flora and fauna. A land whose tranquil loveliness is quite unmistakably, the personal creation of Nature. Time stands still in the Lushai hills of Mizoram. All you'll notice first is the serenity, the hushed wonder, the profound peace that makes them seem quite enchanted, makes them appear a place where man is almost a misfit. But look closer and you will find quiet hamlets nestled amidst this most varied terrain. People live in hamlets in perfect harmony with the natural bounty of Mizoram, unique in their customs, beliefs, practices and lifestyles.

The state of Mizoram is the smallest state of NER in terms of population, i.e. 8.91 lakh as per 2001 census. It has a geographical area of 21,087 sq.km. It is a predominantly hilly state. Mizoram is divided into 8 districts viz.,Aizwal, Lunglei, Saiha, Champhai, Mamit, Lawngtlai and Serchip.

Per capita Income:

In 1993-94, the **per capita income of Mizoram was higher than the All India per capita income by Rs.629.** The per capita income at current prices in 2000-2001 was Rs. 18,491 as compared to All India figure of Rs. 16,707. During the period 1993-94 to 1999-2000, the per capita income grew at a compound annual rate of growth of 12.09% compared to the national average of 11.58%.

Education:

According to the census 2001, **the literacy rate of the state is 88.49%. Out of this 90.699% are male and 86.13% are females.Mizoram is the second most literate state in the country after Kerala. In 1991, literacy rate was 82.3%.**

In the state of Mizoram, the primary stage starts from class 1 to class 4 and the upper primary stage is from class 5 to class 7. Secondary stage comprises of class 11 and class 12. Following table shows the status of school education in Mizoram as on 2000-2001.

No. of Schools(2003-04)	Enrolment	No. of Teachers	Teacher-Pupil Ratio	
Primary	1504	107571	5849	1:18.4
Upper Primary	908	54863	5606	1:18.4
Secondary	443	41404	3231	1:2.8
Higher Secondary	71	10539	663	1:15.9
Govt. College	7	3149	320	1:15.9
Deficit Colleges	10	1722	267	

Source: Statistical Handbook Mizoram, 2004.

Higher Education:

In Mizoram, there are seven Govt. colleges, 10 deficit colleges and some private colleges.

Agriculture:

The economy of the state is mainly agrarian with agriculture and allied activities contributing 29% to the NSDP of the state. **Jhum or shifting cultivation is the usual practice. Nearly 60% of the population is engaged in agriculture in this state.**

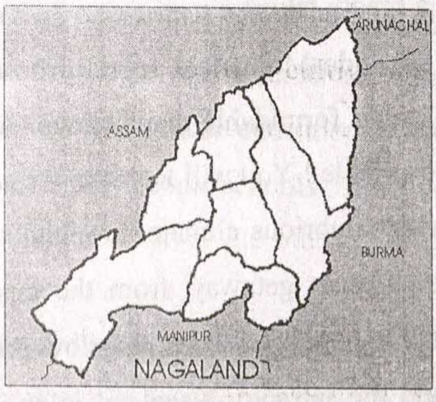
Industry:

The Mizoram is a notified backward area and is categorized under " No Industry State". The state perhaps, is the most industrially backward state in the country. As on March 2000, no. of large and medium industries is only one. This represents very sick position in industrial sector of Mizoram.

Total no. of villages (1991 census)- 698 , Electrified villages (2005)- 695 (99.6%)

No. of Rural household (2001 census)- 79362, Household having electricity.(2001) - 35028 (44.14%)

1.2.6 Nagaland



The State of **Nagaland** was formally innaugurated on December 1, 1963, as the 16th State of the Indian Union. It is bounded by Assam in the West, Myanmar (Burma) on the east, Arunachal Pradesh and part of Assam on the North and Manipur in the South. The State consists of seven Administrative Districts, inhabited by 16 major tribes along with other sub-tribes. Each tribe is distinct in character from the other in terms of customs, language and dress.It is a land of folklore passed down the generations through word of mouth. Here, **music is an integral part of life; folk songs eulogizing ancestors, the brave deeds of warriors and traditional heroes; poetic love songs immortalizing ancient tragic love stories; Gospel songs that touch your soul or the modern tunes rendered exquisitely to set your feet a-tapping.**

Each of the 16 odd tribes and sub-tribes that dwell in this exotic hill State can easily be distinguished **by the colourful and intricately designed consumes, jewellery and beads that they adorn. The present generation of Nagas have ventured into fashion designing in a big way**, reproducing fabrics that represent the ancestral motifs blended with modern appeal. Indeed, it is a beautiful mix of the past with the present...... a paradise for those who are into fashion designing. **This is an affluent fashion station of the East.**

The traditional ceremonial attire of each tribe is in itself, an awe inspiring sight to behold; the multicoloured spears and knives decorated with dyed goats hair, the headgear made of finely woven bamboo interlaced with orchid stems, adorned with boar's teeth and hornbill's feathers, elephant tusk armlets..... You name it! In days of yore every warrior had to earn each of these items through acts of valour, to wear them.

Nature could not have been kinder **to Nagaland, sometimes referred to as the Switzerland of the East;** the exquisitely picturesque landscapes, the vibrantly colourful sunrise and sunset, lush and verdant flora..... this is a land that represents unimaginable beauty, moulded perfectly for a breath taking experience.

Its people belong to the Indo-Mongoloid stock, whose ancestors lived off nature's abundant gifts, blessed with sturdy formidable dispositions. Above all, the people here are warmhearted and extremely hospitable ! You will feel it in the air !

Nagaland is blessed with salubrious climate throughout the year and one can visit it anytime. If one is looking for a quiet getaway, from the hustle and bustle of city life, it provides the right ambience; as life here is laidback and slow-providing a tension free life.

For the adventurous and the intrepid, Nagaland is an ideal place for trekking, rock climbing, jungle camping and offers limitless exploration possibilities in its lush and verdant sub-tropical rain forests which are also a treasure trove of a plethora of medicinal plants.

Nagas, by nature, are lovers of fun and frolic and here life is one long festival.

The Nagas with their joie de vivre, dance and songs are a part and parcel of all their festivities. Most of their dances are performed with a robust rhythm.

Education in Nagaland:

In Nagaland the primary stage of education is from class1-4 and upper primary stage is class 5-8. The secondary education stage is from class 9-10. The Nagaland university is the only university in the state.

Number of Educational Institutions (Schools)

No. of Schools (2002-03	Govt.	Private	Total
Primary	1311	190	1501
Middle	264	218	482
High	121	200	321
Higher Secondary	10	22	32
Total	1706	630	2336

From the above table it can be seen that the number of government sponsored primary schools has increased from 1309 during 2001-02 to 1311 during 2002-03 while the number of private primary schools has remained same at 190 during the same two periods. in case of government sponsored middle schools the number has gone up from 261 in 2001-02 to 264 in 2002-03. The numberof privately sponsored middle schools has remained the same. In case of high schools the number of government sponsored schools has come down from 123 to 121 but that of privately sponsored high schools has increased from 198 to 200 from 2001-02 to 2002-03. The number of government sponsored higher secondary schools has increased from 5 to 10 and that of privately sponsored higher secondary schools has also increased from 18 to 22 during the same year. The total number of higher and technical educational institutions has increased from 56 to 57. These educational institutions include 1 universiy, 36 colleges of general education , 2 polytechnic schools , 3 law colleges and others

Literacy Rate:

The literacy rate in Nagaland according to 2001 census is 67.11 per cent . The percentage of literate males is 71.77 percent and that of females is 61.93 per cent .

Agriculture in Nagaland:

Almost three – fourth of the working population in Nagaland is engaged in the primary sector. Like the other states of the north east, Nagaland is predominantly an agrarian economy with agriculture and its allied activities contributing about 30 % in 1998-99. The contribution of agriculture to the GSDP at constant prices (93-94) of Nagaland stood at Rs. 76069 lakhs and to NSDP at constant prices (93-94) stood at Rs 75147 crores. **Rice is the stable food and occupies about 70 % of the total cultivated area, consisting about 75 % of the total foodgrain production**. Nagaland has hills with terraced fields which produces 20 types of paddy, tough bamboo bushes, white and yellow lilies and other flowers.

Nagaland has been identified as a potential area for development of food processing industries in its geo climatic conditions. The agriculture and allied sectors in Nagaland offer good inputs for development of a host of industries which could include floriculture, horticulture, rubber plantation and allied industries, sericulture, tea cultivation and processing, bamboo shot preservation, mushroom cultivation and processing, piggery, poultry etc.

The food grain production in the state has shown an upward trend during the last 3 decades from 62000 metric tones during 1964-65 to 386300 metric tones by 2002-03. Productivity has also increased from 700 kgs to 1500 kgs. In case of agricultural marketing 14 primary markets, 3 spices curing unit, 5 wholesale market complex are constructed for the service of the farming community .

Industrial Structure in Nagaland:

Due to inadequate industrial infrastructure, lack of mineral resources and transportation, the industrial growth is limited in Nagaland. Despite vast endowment of natural resources, nagaland is considered as one of the most industrially backward states of the country. The industrial structure of Nagaland may be classified, based on resource uses into agro – based industries, mineral based industries, forest based industries and other industries. In case of medium scale industries in Nagaland, there were virtually no industries during the 60's.Handicraft and handloom production only met domestic needs. From 1970 onwards a few medium scale local resource based industries have come into existence. In case of Small Scale Industries (SSI),these began to emerge since 1970s based on local resources

Status of Handicrafts in Nagaland:

The Nagas have a rich tradition of art and craft. The major crafts of Nagaland are artistic textiles, cane and bamboo straw etc., woodware, metalware, bangals and beeds, gems and jewellery. The art of weaving is still popular among the Naga women, especially in the rural areas. **The number of artisans in the state is 0.80 lakhs of which 0.40 lakhs are females.**

Power and electricity in Nagaland:

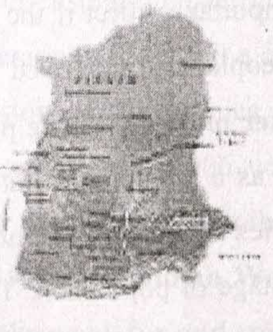
Despite the vast potential, the power generated within the state is quite insignificant. According to the Annual Administrative Report of the department of power, the total power generation was 3.21(MU) and the total purchase was 230 (MU) in 2000-01. Thus the state could generate only 1.39 % of the total power requirements.the state mainly purchase power from NEEPCO , NHPC and PGC

As per Ministry of Power data, Nagaland's share in Central sector stations as on September 30, 2004 was 71.10 MW, while the installed capacity was 101.46 MW. On August 31, 2004, the percentage of villages electrified was 100%. As compared to the national average of 355 kwh, the per capita consumption of electricity was 84.74 kwh. The percentage of rural households having electricity was 47.16 %.

Health:

Nagaland is another state in the north east where the health care facilities are far from satisfactory. For the people of the state, most of there healthcare requirements are met from outside the state in Guwahati and outside the northeast region. This is due to the poor public health infrastructure , lack of adequate infrastructure, lack of adequate qualified doctors, nurses and paramedics and shortage of medicine.

1.2.7 Sikkim



The state is gifted with abundant natural resources. The resources can be grouped into biotic or abiotic, both of which can be renewable. Biotic resources include agriculture crops, fodder and forests. The entire Himalayan region is endowed with natural flora and fauna, and is a natural paradise for nature lovers, conservationists, botanists, zoologists and environmentalists. Sikkim has mountain peaks, lush valleys, rivers, hills, paddy fields among other crops. It is known for its Buddhist Monasteries, on of which is also the centre for learning Buddhist philosophy and other subjects in a nine-year programme leading to a master's degree 'Acharya'. Still untouched by pollution, stunningly beautiful sikkim sorrounded by snow clad peaks, deep valleys, barren crags and cliffs', marshes, meadows and picturesque pastures. There is superstitions among section of mountain people who often use. Corydalis' roots, called "Bhoot Keshi" to ward off evil spirits. Numerous snow-fed streams have carved out river valleys in the west and south. These streams combine into Teesta which is the lifeline of Sikkim. Some notable features are given below :

Mountain peaks -28, glaciers – 21, lakes – 227, rivers and streams – more than 100, flowering plants – 5000, rare orchids – 515, primulus species – 60, rhodo dendrous species – 36, Oak varieties – 11, bamboo varieties – 23, conifer species – 16, ferns and fern allies – 362 types, medicinal plants 424, Fauna : snow Leopard, clouded leopard, red panda, Himalayan black bear, musk deer, the Himalayan Tahr, 550 species of bird, 400 species of butterfly and moth.

Economic Profile:

The economy of Sikkim is mainly based on agricultural and animal husbandry. Approx. 11% of the total geographical area is under agriculture. **Agriculture is of the mixed type and still at the subsistence level rather than commercial level.** The work force participation rate as per 1991 census is 40.44%. The female participation rate in Sikkim is also much higher than the national average. This is an important aspect if the hill economy, as productivity is low and hence all the able-bodied people are employed in agriculture and other activities. **Cultivators account for the greater majority of the people in the state, their percentage is 57.84%.** Agricultural labourers as a whole constitute only 7.81% of the workers in the state, house holds and other industries are negligible, but other worker (Tertiary Sector) at the state level represent a good percentage of population. The decreasing ratio of worker at the state level indicates the low level of economic diversification.

The importance of agriculture can be judged by the high percentage of population approx. 65% engaged in it. Animal husbandry is an integral part of the house hold economy of the region. There are certain house hold industries also which substantially adds to house hold incomes. The past one and half decade has witnessed a tremendous upward swing in various development programs giving a new thrust to the Sikkim economy. This process has increased wage employment opportunities. Though most of the inhabitants are basically agriculture, they have diversified into tertiary jobs such as Government services.

Macro-economic Trend:

This is a chart of trend of gross state domestic product of Sikkim at market prices estimated by Ministry of Statistics and Programme Implementation with figures in millions of Indian Rupees. Sikkim's gross state domestic product for 2004 is estimated at $478 million in current prices. **Sikkim's economy is largely agrarian, based on traditional farming methods, on terraced slopes. The rural populace grows crops such as cardamom, oranges, apples, tea and orchids. Rice is grown on terraced hillsides in the southern reaches. Sikkim has the highest production and largest cultivated area of cardamom in India**. Because of the hilly terrain, and lack of reliable transportation infrastructure, there are no large-scale industries. Breweries, distilleries, tanning and watch-making are the main industries. These are located in the southern reaches of the state, primarily in the towns of Melli and Jorethang. The state has an impressive growth rate of 8.3%, which is the second highest in the country after Delhi.

In recent years, the government of Sikkim has promoted tourism. Sikkim has a vast tourism potential and by tapping into this the state has grossed an earnings windfall. With the general improvement in infrastructure, tourism is slated to be the mainstay of the Sikkim's economy. A fledgling industry the state has recently invested in is online gambling. The "Playwin" lottery, which is played on custom-built terminals connected to the internet, has been a commercial success, with operations all over the country. Among the minerals mined in Sikkim are copper, dolomite, limestone, graphite, mica, iron, and coal.

The opening of the Nathula Pass on July 6th 2006 connecting Lhasa, Tibet to India is expected to give a boost to the local economy, though the financial benefits will be slow to arrive. **The Pass, closed since the 1962 Sino-Indian War, was an offshoot of the ancient Silk Route, which was essential to the wool, fur and spice trade**

Education:

The State has already made great strides in the knowledge-based industries such as Information Technology. The State can gain from the advantage of skilled manpower, which has shown potential for the IT industry. Moreover, given the climate, promotion of knowledge-based industries would enable the State to bypass most of the handicaps the State is afflicted with. A software technology park is being set up which will have wide-bandwidth, stable power supply and incubation space for entrepreneurs. The Department is also promotion IT enabled services like medical transcription, telemedicine, computerized Braille etc.

Infrastructure and Industrial Policy:

So far, the State government has been the major employer in the state. The government has felt the need to create more private sector jobs and is actively pursuing a policy of educating youth on the need to become entrepreneurs and pursue economic activity on their own with active support from the government. The nearest airport is Bagdogra in West Bengal (120 Km) and the nearest railway head is New Jalpaiguri (110 Km) also in West Bengal. However, an airport has been sanctioned by the Union Ministry of Civil Aviation & Airports Authority of India which has been accorded top priority. Construction of the airport is underway and should be operational in the near future. Besides, proposals have also been sent to the Union Government for a railway link connecting Siliguri and Nathula.

Sikkim has a wide network of roads and the Asian Development Bank has agreed to finance the upgradation of the present highway connecting Sikkim with Siliguri in West Bengal. Soon there will be a four lane highway connecting Siliguri and Nathula via Gangtok. Besides, almost all the districts and mainly the industrial hubs of the state are well connected by roads and they are nearer to Siliguri than other parts of Sikkim.Sikkim is a very peaceful state having skilled manpower, banking facilities and no Labour problem.

There are various thrust areas of investment and priority which the government has been focusing on. They are area where the State has a huge potential for industry where the State enjoys a comparative advantage. The major endowments of the State are its nature and natural resources, flora and fauna. The State has also a huge potential for hydel power and trade prospects of opening up of the international border trade through Nathula.

The crucial inputs that the State can make available for industry are its manpower, rich varieties of flora and fauna and various horticultural produce. Sikkim has a potential for medicinal herbs.

Sikkim is a politically stable State with virtually no law and order problem as people are peace loving. The State does not suffer from any labour related problem either. Sikkim probably is the only State in the north-eastern areas, which is free from any insurgency related problems. The friendly environment and pollution free atmosphere is absolutely conducive to investment. There could not have been a better situation.Given the fragility of the eco-system, the approach towards industry is a cautions one and primarily environment friendly. Industries should be entirely pollution free and effluents should be bare minimum with nature friendly disposal of wastes. The strategy would be to build on State's comparative advantages in terms of raw materials and cheap labour surmounting State's handicaps. In other words, promotion of the industries should be in tune with the development strategy.

As per the Tenth Five Year Plan document and the Industrial Policy of the State, possible thrust areas have been identified in consonance with the long-term development strategy that the State is pursuing. They are as follows :
(a) Agro based industries horticulture and floriculture (b) minor forest based industries (c) animal husbandry and dairy products (d) tourism related industries (e) information technology including knowledge based industries (f) precision oriented high value low volume products (g) hydel power (h) tea (i) education and (j) hospitality etc.

However, the State has focused on certain key industries based on their potentials for employment generation, relative comparative advantage, and overall impact on the State economy.Floriculture has a high potential as demand in India and abroad would continue to grow. The State produces varieties of orchids, gladioli, anthuriums and rhododendrons. Commercial cultivation is rapidly picking up. However, storage and marketing remain crucial for successful venture. Given paucity of land, the possibility of cooperative type cultivation of orchids needs to be explored.

The food processing industry: is competitive in presence of large and established producers. The State specializes in mandarin oranges, ginger, tea and cardamom. In terms of prospect, medicinal and aromatic herbs will face an ever-expanding market both nationally and internationally. The varieties of medicinal plants available in the State need to be taken stock of. Wool and silk reeling, weaving and processing, and rabbit farming, all these activities may be carried out at the farm level and they may be treated as the primary or secondary sources of livelihood. The marketing constraint seems to have deterred the development of these industries. The objective would be to provide people with multiple sources of income.Ideal climate and natural beauty of the State augurs will for the tourism industry in the State. The green image of the State with emphasis on village tourism has made the State an attractive destination both nationally and internationally. The multiplier impact of tourism with immense potential for employment generation in a regionally balanced manner would make tourism the leading industry the State should be focusing on.

In line with the argument for development of education industry, the promotion of healthcare industry can also fetch good returns for the State. The ideal climate coupled with easy availability of non-medical support staff can make Sikkim an ideal destination for the health care industry. Availability of medicinal herbs and herbal treatment including yoga, meditation, spa and message, would further contribute to the credence of the State in the healthcare industry. The State is in the process of air connectivity, the healthcare industry may focus on treatment of those suffering from non-critical illnesses and may require prolonged treatment or those who are recuperating.Handicrafts and handloom industry has the potential to promote income and employment generation in a big way. The high quality traditional handicrafts and handloom products enjoy a good market, both nationally and internationally. The traditional crafts like carpet weaving, cane and bamboo crafts, spinning wool, handmade paper and Thanka paintings are famous and enjoy government patronage in as far as training is concerned. A proficient manpower base is already available in this field. All that is required is expertise to be organized so that quality and design can be upgraded. Professionals in the field of marketing and supply could work wonders with this traditional industry of Sikkim. However, marketing of the product depends on growth of tourism promotion outside the State by the Government and adequate supply of input and infrastructure support. Gangtok Craft Fair and modernization of looms are steps in the right direction. Sikkim has to focus on "product differentiation" as Sikkim faces competition from other north-eastern States.

Hydel power is another prioritized area that has tremendous potential. The capacity to tap 8000 MW of hydel power is there for the asking.

The State Government has already identified areas for setting up of growth centres. The new Industrial policy, provides a list of locations for setting up of the new industrial units. The Government has already declared Rangpo-Gangtok, Melli-Jorethang and Jorethang-Rishi and Ranipool-Gangtok as industrial corridors for giving the land to the investors on a lease basis.

The developed land will be allotted on a lease basis for a period of thirty years. The State Government will subsidise the cost of land depending on the nature of industries. For small-scale industries, it is 25 percent, export oriented units and units managed by local entrepreneurs at the rate 30 percent and large and medium units at the rate of 15 percent. Other than this, one more option the State can think of is to ensure that the landowners are made partners in business.

In certain areas, the State can invite the market leaders where large investments are required to make them competitive. Furthermore, the leaders can bring with them expertise and knowledge. Exploring market would cease to be a problem for the enterprises. This would be relevant for industries such as education and healthcare industry, production of medicinal herbs etc, hydro power, tourism etc.

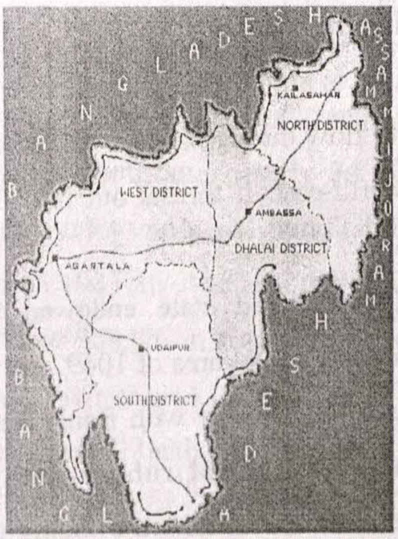
Given the background of the industrial scenario in Sikkim, the Department of Commerce & Industries, Govt. of Sikkim has embarked on a road map for industrialization in the State of Sikkim. The State is very conscious of the ecology and its environment.

With the opening of the border trade through Nathula Pass, we have approximately 80 investors who have applied for license in various manufacturing units, which is also capital and labour intensive and the Department is processing their documents accordingly, through a single window system. The Government is according all priority to expedite investment.

With this situation, the State can definitely look forward to a great deal of employment opportunity and revenue generation with the type of industries set up in Sikkim. Moreover, the long term benefit both for the investor and the Government is enormous.

Further, with the new Industrial Policy, the fiscal incentives and various incentives, and with the pro-active policy of the Government, an era of industrialization in Sikkim has already begun, which is ready to tapped.

1.4.8 TRIPURA



Tripura is one of the seven states in the north eastern part of India located between 22 degree and 56 minutes and 24 degree and 32 minutes north latitude and between 90 degree and 09 minutes and 92 degree and 20 minutes east latitude. It is bounded on the north, west, south and south-east by Bangladesh whereas in the east it has a common boundary with Assam and Mizoram. It is fact that in days of yore the boundaries of Tripura was extended up to the Bay of Bengal when its rulers held sway from Garo hills to Arakan.

The history of Tripura as a administrative unit dates back to the days of Maharajas when the territory was a native State. It is significant to note that all though Tripura was conquered by force of arms in 1761, no Political agents was appointed in the State till 1871 - a gap of 110 years. The former princely state of Tripura was ruled by Maharajas of Manikya dynasty. It was an independent administrative unit under the Maharaja even during the British rule in India though this independence was qualified, being subject to the recognition of the British, as the paramount power, of each successive ruler. After independence of India, an agreement of merger of Tripura with the Indian Union was signed by the Regent Maharani on September 9, 1947 and the administration of the state was actually taken over by the Govt. of India on October 15, 1949. Tripura became a Union Territory without legislature with effect from November 1, 1956 and a popular ministry was installed in Tripura on July 1, 1963. On January 21, 1972 Tripura attained statehood.

There is a common belief that the name of the State has originated from "Tripura Sundari" - the presiding deity of the land which is famous as one of the 51 pithos of Hindu Pilgrims. Apart from this traditional view it is believed that originally the land was known as "Tuipra" meaning a land adjoining the water.

All over India the Gomukh is an auspicious emblem. Ancient drinking fountains and clear springs are often directed to flow through spouts fashioned in the form of a cow's head. Tripura is the gomukh of the north-east. It thrusts out into Bangladesh with only its neck attached to Mizoram and Assam.

Tripura is a hilly and landlocked state endowed with vast green forests and established gas reserves. The state has a total area of 10492 sq. km. and attained statehood on January 21, 1972. The state has a long border with Bangladesh of 856 km. **After Kerala, Tripura is the largest producer of natural rubber and the rubber produced is of superior quality. The state also has the distinction of being the highest producer of True Potato Seeds in the country.**

Education in Tripura:

Tripura as a state has a higher literacy rate (60.44% according to 1991 census) than India , as a country. Tripura Madhya Shikshya Parishad, responsible for conducting the State-wise 10th and 12th level examination was formed in 1976.Before that the students in Tripura could give those public examinations under West Bengal Board of Secondary education. Higher education in Tripura has been given priority during the five year plans . Every year a few top students join the various highly reputed technical institutions of the country.

Number of Educational Institutions in Tripura
2004-05

Primary School	1849
Middle School	1005
High School	416
Higher Secondary	245
University	1
General College	14
Engineering College	1
Law College	1
Polytechnic Institute	2

Source : Economic review of Tripura 2004-05

Agriculture in Tripura:

As in the other states of the north east , Tripura's economy is primarily agrarian and agriculture and its allied activities contributes nearly 34 % to the state's Net Domestic Product . Agriculture in Tripura includes traditional Jhum (shifting) cultivation.

As per Agricultural Census 1985-86 , the area under operational holding was 317596 ha. Which has come down 2.9% to 308376 in Agricultural census of 1990-91. The average size of the holding has also come down from 1.02 ha. in 1985-86 to 0.97 ha. In 1990-91. The food grain production in 2000-01 was 5.23lakh tones and the yield was 2059 kg/ha.

Status of Handicrafts **in Tripura:**

The major crafts of Tripura are artistic textiles, cane and bamboo products , mat weaving ,straw , grass and fibre work tec.As per census of Handicrafts conducted by NCAER during 1995-96 , the number of artisans employed in the state of Tripura are as under –

No. of artisans-total – 2.45 lakhs, male –1.32 lakhs, female –1.13 lakhs

Industry **in Tripura:**

The necessity of industrialization is a means of achieving rapid growth and prosperity has long been recognized in the strategy of development of any region and Tripura is no exception . It is unfortunate that the state is yet to emerge out of industrial backwardness. The Central Government has declared the entire state as 'A' category backward area for the purpose of giving central investment subsidy

No. of Villages Electrified in Tripura :

2004-05- 821 villages electrified (95.8%)

1.3 School Education Statistics of the region

States	Villages	Population not covered by school	No. of Primary Schools	No. of Upper Primary Schools	Secondary Schools	H.S. Schools	Teachers (full time & Para teachers)
Arunachal Pradesh	3957	193297	1338	359	132	72	9887
Assam	22752	28,52046	30041	7726	3714	765	209765
Manipur	2367	164762	2552	794	540	112	29562
Meghalaya	5916	130479	5817	1559	513	83	26767
Mizoram	726	10900	1253	847	340	45	14458
Nagaland	1163	63403	1367	469	256	27	17560
Sikkim	443	61933	498	135	88	43	8104
Tripura	869	343292	2051	435	403	240	33572
						Total	3,49,675

Table 1 : No. of Schools in each NE State

Source: 7th all India survey-NCERT, statistics from rspective states

The approximate ratios of the number of teachers to number of schools are:

(a) No. of Senior Secondary Teachers = N_1 (No. of H.S Schools) × a multiplier (varying between 25 to 30)

(b) No. of Secondary Teachers = N_2 (No. of Secondary Schools) × a multiplier (varying between 10 to 13)

(c) No. of Upper Primary Teachers = N_3 (No. of Elementary Schools) × a multiplier (varying between 4 to 6)

(d) No. of Primary School Teachers = N_4 (No. of Primary School) × a multiplier (varying between 2.5 to 5)

No. of untrained Elementary Teachers	11,452	82,908	3326	6424	3948	3884	6280	6778	1,25,000

	Meghalaya	Assam	Aru'Pradesh	Manipur	Mizoram	Nagaland	Sikkim	Tripura	Total
LPTeachers	13034	99765	4300	6000	4610	4500	2500	8000	142709
UPTeachers	6607	50000	1980	4000	4500	2000	1500	2400	72987
Se.Teachers	4990	40000	1707	5400	4148	3000	1000	5030	65275
H.S Teacherss	2136	20000	1900	2800	1200	1000	1075	7000	37111
	209765	209000	9887	18200	14458	10500	6075	22430	318082

Table 2. No. of Teachers at various levels : Source: 7th all India survey-NCERT, statistics from respective states

1.4 Ground realities and school curricula:

Has the School Curriculum and Teachers' Training Curriculum addressed the region - specific ground realities

1.4.1 Recent Socio- political scenario

"Foreign observers have looked at north-east India's predicament, their diagnosis and policy prescriptions have been radically different from those of our security and development establishments. Consider a report done last year by the World Bank – not exactly a bastion of radicalism. It describes the region as 'a victim of a low-level equilibrium where poverty and lack of development (compared with the remainder of India and other South East Asian nations), lead to civil conflict, lack of belief in political leadership and government, and therefore, to a politically unstable situation. This in turn leads to further barriers to poverty reduction, accelerated development and growth'.

The report does not say that spending more money for development or greater militarisation are the answers to this condition. Instead it sees institutional arrangements as the major obstacle to utilising the region's vast water resources for sustainable development. Our highly centralised approach, it finds, suffers from "the paternalism of central-level bureaucrats, coercive top-down planning, and little support or feedback from locals". Local stakeholders in north-east India have such distrust of these centralised structures that no one believes that developmental initiatives are actually meant for bringing about real benefits. So deep is the mistrust that the study team found to its astonishment that even an embankment project designed to benefit the people of an area, is opposed by its intended beneficiaries.

This is the cumulative legacy of five decades of bad policy. The World Bank study was done in collaboration with government's Department of Development of North Eastern Region. Yet there is little interest in focusing on this aspect of the report on the part of our bureaucrats. The report warns of the dangers of path dependency – of being locked into bad choices even when better alternatives are quite obvious. It calls for "strong political will to counteract the tendency of a society to follow the path it has already taken due to the political or financial costs of changing it". This applies not just to managing water resources: but to our entire approach to the north-east"... *Sanjib Baruah, IIT-Guwahati, Times of India, Delhi, 16 Jan. 2007.*

1.4.2 If National Curriculum Framework is about bringing child pre-knowledge in the classroom, is about constructivisum, the diversities in the soil-environment-tradition-culture-social practices-faith-religious practice across the eight states are almost endless to be addressed in one single on any subject textbook for all states. Moreover there are contemporary issues which are to be addressed by the school education.

(a) On such issue is **HIV awareness.** Union Ministry State for Health and Family Welfare said in Rajya Sabha (Dec. 2006) that Manipur and Nagaland are high HIV prevelence states with a level of over one percent HIV infection.

(b) Any girl of this country will be wanting to know more about the **uprising by womenfolk of Maniur** on December 12, 1939 to stop rice export from the famine struck

Manipur. The day is celebrated even today as Nupi Lal memorial Day this uprising was the second women's movement in Manipur, the first being in 1904 when Manipuri women rose against the British policy of forced labour imposed on the people of Manipur as well as against illological hike in water tax by the British. The unity and determination of Manipuri women are seen in many social issues of today like safe guarding territorial integrity, campaign to fight against Aids, and drug abuse, etc. women liberation is a reality here. Women of Manipur have already been controlling the market of Imphal, where selers are women, buyers are women and even suppliers are women and the area is called Ima Keithel or Mothers' Market.

(c) Agriculture practice

in this region varies from state to state due to many variables. One does not generally hear of snails destroying vegetables. In Mizoram swarms of giant snails swallow everything overnight one and above attacks by grasshoppers, caterpillars and rodents. Mizoram is also experiencing gregarious bamboo flowering. According to locval people this signals an impending famine. Tribal legends say that when bamboo flowers famine, death and destruction follow. Behind this superstition lies some truth. Blooming bamboo triggers invasion of rats which feed on protein-rich bamboo seeds. Rats multiply at a rapid rate and attack all types of crops and graneries – causing famine. Mizoram recorded a famine in 1862, 1911 and 1959.

The importance that **Agriculture deserves in the curriculum** is apparent from the following:

- Agriculture provides livelihood support to 70% of the population of NER.
- The tea industry of NER is the **world's largest tea growing region** having 16% shares, and is the **largest producer and exporter of tea** in India (share 55%).
- NER is the **Largest producer** of bamboo.
- It is **World's Single largest** Tea growing region (16% share).
- 53% of total work force in Assam are engaged in agricultural activities
- In Manipur the majority of the population get their means of livelihood from the agricultural sector as they have accepted agriculture as the primary occupation.
- In Manipur the non – agricultural activities in the state have remained more or less a household level of enterprise rather than evolving into a full scale industrialization process

- The economy of Mizoram is mainly agrarian with agriculture and allied activities contributing 29% to the NSDP of the state. Jhum or shifting cultivation is the usual practice. Nearly 60% of the population is engaged in agriculture in this state.
- In Nagaland Rice is the stable food and occupies about 70% of the total cultivated area, consisting about 75% of the total foodgrain production. Nagaland has hills with terraced fields which produces 20 types of paddy. tough bamboo bushes, white and yellow lilies and other flowers.
- In Sikkim Agriculture is of the mixed type and still at the subsistence level rather than commercial level. Cultivators account for the greater majority of the people in the state, their percentage is 57.84%. The importance of agriculture can be judged by the high percentage of population approx. 65% engaged in it. Sikkim's economy is largely agrarian, based on traditional farming methods, on terraced slopes. The rural populace grows crops such as cardamom, oranges, apples, tea and orchids. Rice is grown on terraced hillsides in the southern reaches. **Sikkim has the highest production and largest cultivated area of cardamom in India**
- After Kerala , **Tripura is the largest producer** of natural rubber and the rubber produced is of superior quality . The state also has the distinction of being **the highest producer of True Potato Seeds** in the country.

Yet the NER continues to be a net importer of food grains

1.4.3 Industry

- In engineering and heavy industry, the NER continues to be the most backward region in the country
- Meghalaya can be identified as one of the industrially backward states in the country.
- Each state has its signature cottage industry . Whether it is weaving or bamboo craft or cane craft , the hand made article carries a mark of artistry which speaks of generations of practice.
- There remains a great scope for the Tourism Industry to flourish

- In Manipur Rajashree Bhagyachandra created the famous *Ras Lila*, the **classical dance of Manipur** which is now famous globally
- In Nagaland music is an integral part of life; folk songs eulogizing ancestors, the brave deeds of warriors and traditional heroes; poetic love songs immortalizing ancient tragic love stories; Gospel songs that touch your soul or the modern tunes rendered exquisitely to set your feet a-tapping.
- Nagaland is an **affluent fashion station of the East**. Nagaland is sometimes referred to as the Switzerland of the East
- The **Nathula Pass** (closed since the 1962 Sino-Indian War), has been recently opened. As an offshoot of the ancient Silk Route, which was essential to the wool, fur and spice trade , the gate will again play a major role in improving cultural relations with the neighbouring countries.

1.5 Ministry of Development of North Eastern Region (DONER), North Eastern Council (NEC)

Ministry of Development of the region set up on 27 May, 2004 has five Central Plan Schemes.

Non-Lapsable Central Pool of Resources

- Advocacy
- Capacity building
- Assistance to Sikkim Mining Corporation
- North Eastern Finance Development Corporation

North Eastern Council (NEC) was set up in 1971. It has been revitalised under the CMP of UPA Govt. to effectively function as a Regional Planning Body for the North East.

NEC has initiated a mass-contact programme covering 50,000 househlds to know ground realities including the needs of people. 10 additional road projects, three Interstate has Terminus, developing 10 airports, Sports development are some areas of infrastructure development funded by the NEC. For 2006-07, the budgetary allocation for NLCPR has been Rs.700 crores.

NEC has set up North East Regional Educational Council (NEREC) which comprises of vice-chancellors of all universities in the region, state governments, IGNOU and NCERT representatives. "Teaching skill of teachers in the NE Region need to be improved

1.4.4 Human Develoment

- As per the National Human Development Report , 2001 , Manipur hasthe distinction of having the lowest infant mortality rate in the country
- All the states in NER has much higher levels of **population below poverty line** [35.13%] as compared to the national average (26.1%) [2000-01]
- The **share of urban population to total in the NER is 14.6%.** The national average in this regard is 27.8% [2001 Census].
- The region represents **one of the highest rates of unemployment in the country**, with an unemployment rate close to 12%, against the national average of 7.7% [1999-00].
- The **average per capita income of the region is Rs. 12,918 which is lower than** the national average of Rs. 17,823 (2001-02). It also rank for below the indices of national average in power, road length, hospital beds, etc. Its literacy levels are higher than the national average.
- Economically, **out of the eight North East States, Assam is the most developed**. But compared to other states like Maharashtra, Tamilnadu, Gujarat, Assam lags far behind in almost all economic spheres
- In 1993-94, the **per capita income of Mizoram was higher than the All India per capita income by Rs.629.**
- According to the census 2001, the literacy rate of Mizoram is 88.49%. Out of this 90.699% are male and 86.13% are females. **Mizoram is the second most literate state in the country after Kerala. In 1991, literacy rate was 82.3%.**
- The UPA Govt's CMP (Common Minimum Programme) calls for providing basic minimum services, improving infrastructure, creating investor-friendly environment.

1.4.5 Culture

- The eight states that comprise the region reflect ecological and cultural contrasts between the hills and the plains
- The North East is one of **the most biodiverse regions in the world**
- All states in the region have rich cultural heritage . One finds traditional folktale, folklore, music, dance , etc in many forms at their best

educational institutions that lack the necessary infrastructure. **Besides supporting formal education, a satellite system can facilitate the dissemination of knowledge to the rural and remote population about important aspects like health, hygiene and personality development and allow professionals to update their knowledge base as well. Thus, in spite of limited trained and skilled teachers, the aspirations of the growing student population at all levels can be met through the concept of tele-education.**Edusat Network could be used for administrative purposes and even for conducting on line examinations and evaluations The concept of beaming educational programmes through satellites was effectively demonstrated for the first time in India in 1975-76 through the Satellite Instructional Television Experiment (SITE) conducted using the American Application Technology Satellite (ATS-6). **During this unique experiment, which is hailed as the largest sociological experiment conducted anywhere in the world, programmes pertaining to health, hygiene and family planning were telecast directly to about 2,400 Indian villages spread over six states.** Later, with the commissioning of INSAT system in 1983, a variety of educational programmes is being telecast. In the 90s, Jhabua Developmental Communications Project (JDCP) and Training and Developmental Communication Channel (TDCC) further demonstrated the efficacy of tele-education.With the success of the INSAT based educational services, a need was felt to launch a satellite dedicated for educational service and ISRO conceived the EDUSAT Project in October 2002.

2.2 Launching of the 1950 kg EDUSAT

It was launched from Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota, into a Geosynchronous Transfer Orbit (GTO) by ISRO's Geosynchronous Satellite Launch Vehicle (GSLV). From GTO, EDUSAT will reach the 36,000 km high Geostationary Orbit (GSO) by firing, in stages, its on board Liquid Apogee Motor (LAM). In GSO, the satellite will be co-located with KALPANA-1 and INSAT-3C satellites at 74 deg East longitude.

Compared to the satellites launched in the INSAT series so far, EDUSAT will have several new technologies. The spacecraft is built around a standardised spacecraft bus called I-2K. It has a multiple spot beam antenna with 1.2 m reflector to direct precisely the Ku band spot beams towards their intended regions of India, a dual core bent heat pipe for thermal control, high efficiency multi-junction solar cells and an improved thruster configuration for optimised propellant use for orbit and orientation maintenance. The satellite uses radiatively cooled Ku-band Travelling (with special emphasis on teaching of Science and Mathematics, as desired by the Hon'ble PM in his inaugral address at the first meeting of the restructed NEC) and a beginning may be made at the Primary School level. This is also the considered view and recommendation of NEREC. .... number being large, training will have to be conducted in batches at specially selected locations across NER by specially oriented trainees ... this initial training would have to be followed up by refresher courses at appropriate intervals. Here we could take advantage of ODL and ICT... coverage of ODL and ICT would need to be vastly extended in the NER on a crash basis ..." (*P.P. Srivastav, member NEC, in his letter to NCERT, 5 May 2007*)

HRD initiatives:

A sum of Rs. 8 crore was allocated during 2005-06 for capacity building scheme. State Govt. officers were trained by IIM-Kolkata, training programmes were conducted on joint forest management, diaster management and eco-tourism, etc. ITES and BPO-related courses were organised by DOEACC in 5 towns, DGET arranged courses for women in dress making, television repair, skin care, etc.

Data source : Information from NEC, NER , Govts. of each of the 8 states in the public domain, interviews,newspapers,etc.

2. EDUSAT

2.1 Education as an instrument of social change

The universalisation of education has become the top priority, especially for the developing countries. But the extension of quality education to remote and rural regions becomes a Herculean task for a large country like India with multi-lingual and multi-cultural population separated by vast geographical distances, and, in many instances, inaccessible terrain. Since independence, India has seen substantial increase in the number of educational institutions at primary, secondary and higher levels as well as the student enrolment. But the lack of adequate rural educational infrastructure and non-availability of good teachers in sufficient numbers adversely affect the efforts made in education.

Satellites can establish the connectivity between urban educational institutions with adequate infrastructure imparting quality education and the large number of rural and semi-urban

Wave Tube Amplifiers (TWTAs) and dielectrically loaded C-band DEMULTIPLEXER for its communication payloads.

Vastly extended in the NER on or crash basis ... "(PP Shrivastava, member NEC, in his letter to NCERT dt. 5th May 2007

EDUSAT carries five Ku-band transponders providing spot beams, one Ku-band transponder providing a national beam and six Extended C-band transponders with national coverage beam. It will join the INSAT system that already has more than 130 transponders in C-band, Extended C-band and Ku-band providing a variety of telecommunication and television services.

2.3 EDUSAT - the first exclusive satellite for serving the educational sector

It is specially configured for audio-visual medium, employing digital interactive classroom and multimedia multicentric system. The satellite will have multiple regional beams covering different parts of India — five Ku-band transponders with spot beams covering northern, north-eastern, eastern, southern and western regions of the country, a Ku-band transponder with its footprint covering the Indian mainland region and six C-band transponders with their footprints covering the entire country. EDUSAT is primarily meant for providing connectivity to school, college and higher levels of education and also to support non-formal education including developmental communication. The scope of the EDUSAT programme is planned to be realised in three phases.

In the first phase of pilot projects, a Ku-band transponder on board INSAT-3B, which is already in orbit, is being used. In this phase, Visveswaraiah Technological University (VTU) in Karnataka, Y B Chavan State Open University in Maharashtra and the Rajiv Gandhi Technical University in Madhya Pradesh are covered.

In the second phase, EDUSAT spacecraft, once commissioned in orbit, will be used in a semi-operational mode with at least one uplink in each of the five spot beams. About 100-200 classrooms will be connected in each beam. Coverage will be extended to two more states and one national institution.

In the third phase, EDUSAT network is expected to become fully operational. ISRO will provide technical and managerial support in the replication of EDUSAT ground systems to manufacturers and service providers. End users are expected to provide funds for this. In this phase, ground infrastructure to meet the country's educational needs will be built and during this period, EDUSAT will be able to support about 25 to 30 uplinks and about 5000 remote terminals per uplink.

While ISRO will provide the space segment for EDUSAT System and demonstrate the efficacy of the satellite system for interactive distance education, content generation is the responsibility of the user agencies. The quantity and quality of the content would ultimately decide the success of EDUSAT System. This involves an enormous effort by the user agencies.

2.4 Exemplary uses of EDUSAT in India by now

(a) EDUSAT is configured for audio-visual medium employing digital interactive classroom lessons and multimedia content. The ground coverages are specially configured to cater to the educational requirements of the country. The EDUSAT programme is primarily for school, college and higher levels of education and to support non-formal education. EDUSAT pilot projects were taken up in Karnataka, Maharashtra and Madhya Pradesh ahead of EDUSAT launch using INSAT-3B, covering Visveswaraya Technological University in Karnataka, Y B Chavan Open University in Maharashtra and Rajiv Gandhi Technical University in Madhya Pradesh.

In the present semi-operational phase of EDUSAT programme, Karnataka Primary Education Project under 'Sarva Shiksha Abhiyan' covering 885 primary schools has been made operational using the southern regional beam of EDUSAT. Networks for IGNOU, CEC/ University Grants Commission (UGC), CIET / National Council of Educational Research and Training (NCERT), All India Council for Technical Education (AICTE) and Department of Science and Technology (DST) have been set up using the national beam.

Interactive networks for Kerala and Tamil Nadu are operational and extensively used for teachers' training and other training programmes using regional beam.

School networks in Chamarajanagar and Gulbarga in Karnataka, Madhya Pradesh, Uttar Pradesh, Bihar, Mallapuram in Kerala and Lakshadweep are under various stages of implementation. As of now, about 2,700 schools are benefited by this programme. About 900 interactive networks for application of Higher and Technical education and teachers' training are operational at present. Many networks in J&K and in North Eastern states will soon be operational. A total of 33 interactive/ROT networks are proposed, in the national beam and regional beams of which 12 are operational. This includes a unique network for Blind Peoples Association operating in Ku-band western regional beam established in 10 blind schools of Gujarat. At present, more than 2300 classrooms have been connected through EDUSAT in various educational networks.

(b) Visvesvaraya Technological University (VTU), Belgaum, Karnataka, the first university to implement EDUSAT-based e-classes for technical education, has successfully completed 1000 sessions of lectures via EDUSAT. To mark the 1000th session, a special panel discussion was organised at DSERT Campus, Bangalore on March 23, 2006 .The panel had interaction with the students via satellite to review the effectiveness of the programme so far and modifications required to tune improve the effectiveness further.

VTU had initiated the pilot projects even before the launch of EDUSAT by using other INSAT satellites. Since the commissioning of EDUSAT network connecting all the 120 engineering colleges of VTU, classes are being conducted for about 8 hours daily. The students spread across Karnataka state have benefited immensely by listening and interacting with some of the best subject experts. Every semester, 7 to 8 subjects are taught. So far, three programmes covering 669 sessions and 331 sessions under the on-going fourth programme have been completed. The subjects covering various disciplines like civil, mechanical, electronics, electrical, computer science and information science are being transmitted live everyday from VTU Studio situated at DSERT campus at Bangalore.

VTU is the very first institute to implement EDUSAT programme and a role-model for other institutions of higher education to implement EDUSAT based classrooms across the country.

The Karnataka Government is proposing to set up a separate directorate for technology enabled education to adopt the latest technology at all levels of education. VTU is going ahead to implement various other projects like technology enabled education, e-learning, e-campus, etc. Karnataka is one of the pioneering states in using space-based technology for sustainable benefits like primary education in Chamarajanagar District, telemedicine network connecting super specialty hospitals to rural and district hospitals and use of remote sensing satellites for monitoring and evaluation of watersheds.

2.5 Report of DECU (ISRO) on

Educational Programmes : Perspective of Students and Teachers

A. Development and Educational Communication being the mandate of DECU, several studies have been initiated in order to understand the present trend and the measures that are essential to strengthen the social set up. After the launch of Edusat, several users across the country have come forward to use the network for connecting the educational institutes. In order to understand the utilisation of the network, DECU has **undertaken studies like availability of educational CDs in the market, the level of media exposure among the students as well as teachers, the type of format that is popular among the students in the educational programmes etc.** DECU in collaboration with the Gujarat Secondary and Higher Secondary Education Board (GSHSEB) has **produced prototype educational programmes for the students of 8 th std**. These programmes were made on the hard spots, as identified by the teachers, on three subjects i.e. English, Mathematics and Science. After the programmes were made it was shown to the students, teachers and the subject experts in two different schools located at Himmatnagar and Baroda with an objective to...

- Evaluate the comprehensibility of content and language of the programme.
- Find out whether the format of the programme is attention holding and of interest to the target group.
- Understand teachers' perspective on the programme.

B. Students found all the programmes to be very interesting and attention holding. The animations, illustration used in the programmes helped the students in increasing their comprehension level and due to which the percentage of the students who would prefer to watch the educational programme is very high. The students were keen on watching the curriculum based programme as the audio visual element helps in simplifying the concepts that were taught in the conventional pattern of chalk and talk method. There was a felt need among the students that curriculum based programmes should be produced more in number so that the classroom teaching, supplemented with the audio and visual material can yield better result. There was a mixed reaction among the students regarding the duration of the programme – some of the students found the programmes on English are of shorter duration and some of them found the programmes on Science very lengthy. Thus, a proper balance has to be maintained while making programmes. The students were also of the view that instead of having a more detailed discussion of one concept, there should be more than one concept that needs to be elaborated in one programme, which should be supported by lots of illustrations and examples. There was unanimous agreement among the students that the language of the programme should be both in Hindi and Gujarati. The students had the opinion that the programme should be telecast on television especially during the night time as this is the most suitable time for the students to view the programme.

C. **Teachers** found the programmes on English to be very good and believe that these kinds of programme would help the students to have a better knowledge about the subject.

The visuals have great impact and detailed description of the subjects have also made it possible for the students to learn the subjects thoroughly. Teachers found the language of the programme quite easy to follow and are of the opinion that even though the programme is in English, a combination of Gujarati and English should be used to teach the subject. In order to make the programmes more interesting, more examples, visual aids should be used. The teachers are of the opinion that the visuals, explanations, diagrams that were used in the programmes of Mathematics have greater impact and it increases the retention level of the students. Since the subjects have already been taught in the school, the programmes were complimentary to it. The language was simple and the teachers are of the opinion that the all the subjects should be taught in both regional as well as in English, as teaching in English would help the student to learn English as a language. The use of visuals from the texts, instant feedback between the teacher and the students were some of the suggestions provided by the teachers to make the programmes more interesting. The schools should take necessary steps to incorporate these programmes in the school time table so that the students can view the programme at school. It was suggested by the teachers that these programmes should be telecast in the evening hours in Doordarshan so that the children who missed at school can learn different subjects and topics by sitting at home.

The science teachers liked the programmes very much especially the animations and graphics which were useful in explaining the experiments to the students as it is at times difficult to conduct experiments in the class room. It also helps in increasing the retention level of the students.

D. The subject experts shared their experience in creating the multimedia based content for syllabus oriented teaching. The teacher / the anchor of the programme needs to be ynamic and should be able to sustain interest of the students. Instead of taking up all the lessons of one subject, it is better to make programmes on the difficult concept and elaborate it to the students so that it would be easier for them to follow. This would in turn save some time in programme production. The teacher should use more familiar and innovative means of teaching, for e.g. the teacher in the programmes on angle drew lines on the green board. It could be elaborated with the help of a piece of paper or could be elaborated differently.

Live demonstration and examples of Indian context should be used so that the students could co-relate to the context of discussion. The programmes should also aim at teaching concepts beyond the prescribed syllabus.

The most important element in the process of content creation is to train the teacher and ask them to create the content on their own. This would help the teacher's to create innovative and creative content of his or her own preference.

There needs to be a pool of the subject experts, teachers and schools in order to avoid duplication of efforts made in the direction of content creation.

E. Feedback from the Users

Various technologies used for mass entertainment influence the people of all age groups in all walks of life. The reasons could be many like audio-video component, facility of live interaction, attraction towards latest technology etc.

Use of satellite technology for the cause of education was started sometime in last quarter of 20th century in India. The initiatives were taken by ISRO, UGC, IGNOU, NCERT etc. in a joint collaboration. The main intention was to impart education to masses through its countrywide class-room series. The idea of reaching to large groups for educational purpose in geographically distant areas, at a time, through satellite was unique. It has come as a support to distance education to fulfill the aim of democratic of education.

F. Edusat- a tool for mass education?

- Edusat offers opportunities for using satellite for educational activities at par.
- Edusat is useful for the developing country (where resources are scarce for education sector/system due to other priorities) to popularise distance education.
- Edusat fulfills the basic requirement of an individual i.e. to meet and be familiar with whom he/she is learning, from whom they are learning, raising their doubts immediately, getting solutions from teacher immediately on a personal level. Edusat is an answer to distance. It offers two-way audio-video interaction as an inbuilt feature, to overcome the barrier of distances education learners can meet their teachers as well as their co-students from different parts of the country- their counter part of Jammu or Rajasthan or Kolkata, which can result in positive development and popularity of distance education.

G. Users meet at North-East

A meeting with the **Edusat users of North-East** was held on June 20, 2006 in order to be acquainted with the present status of installation and commissioning of the work that has been carried out so far; to understand the problems and difficulty that is faced during the process of installation and to discuss the strategies for content generation. The meeting was attended by all the users of North-East region, concerned officials from ISRO Headquarter, SAC, DECU and BEL. The issues and concerns of each of the states was discussed individually. At three states namely Arunachal Pradesh, Meghalaya and Tripura the network has already been established and the utilisation of the network will be starting soon.

H. Edusat National Users' Meet

The Edusat National Users' Meet was jointly organised by DECU and CIET/NCERT, New Delhi on September 26, 2006. The Edusat users like IGNOU, CEC, CIET/NCERT, DST, IDSP and NITTTR (AICTE) had joined themeet to share their experiences, present utilisation status and the strategies which can be put into practice for effective utilisation of network. Apart from the users' the vendors of National Network were also present. Several issues related to present utilisation, feedback and monitoring mechanism, content generation, operational issues like - technical issues, especially related to hardware, annual maintenance contract (AMC), computer maintenance contract (CMC) etc. were discussed in detail. It is quite evident from their discussion that all the applications of Edusat are used quite effectively by all users except AICTE which, focuses on the broadcast of the programmes than conducting interactive sessions. All the users have developed methods of obtaining feedback and monitoring of all the respective receiving centres. It has also been agreed upon by all the users to share their feedback on monthly utilisation of the network and the lessons learnt in Edusat utilisation with DECU /ISRO and other users.

I. Edusat Regional Users' Meet was organised by DECU at Ahmedabad during October 30-31, 2006, in which the users of the entire regional beam i.e. of 17 states and the vendors participated. The meet was attended by forty four participants and two vendors. The presentations focused on each user's present utilisation plan, their concerns in terms of hardware, content generation, installation and commissioning of the network, daily operational issues, research, monitoring and feedback mechanism and future utilisation plan etc. Apart from the users the vendors also talked about the present status of installation of the network at different states. In some states like

Jammu, Jharkhand, the terminals have been installed and utilisation of the network will be commenced soon. In some cases the universities like VTU, CEC shared their experiences in using the network in detail. The sharing of experiences has given the users a direction for more meaningful and effective utilisation of the network.

J. Training of Resource Persons in Content Generation

In order to make the content generation effortless, DECU has initiated a training programme for the resource persons in Content Generation. So far, the training programme was conducted for NIOS, Madhya Pradesh, Rajasthan, Shrinagar and Jammu Network under Edusat and similar kind of training programme will be held in near future for Dehradun, Tripura and AICTE Networks under Edusat. The training highlights:

- The duration of the programme is 5 days.
- A complete insight into the content delivery system on Edusat network.
- Different aspects involved in content creation for television as well as multimedia.
- Imparting training on shooting, editing and creating video clippings.
- Giving hands on experience on generating power point presentations, video clipping etc. through Edusat network in real and simulated manner.
- Recording of the presentations and analysis.
- Great opportunity to the Resource Persons to do the presentation on Edusat Network using various teaching aids and multimedia elements.

K. Frequently Asked Questions

(the answers were obtained thro' e-mail from DECU/ISRO)

(a) *when was exactly the transponder made operational ?*

Edusat was launched on September 2004 and made operational after a month.

(b) *how many hours have been utilized in transacting lessons to the receiving centres/ classroom ends since EDUSAT was operational ?*

It has been utilised by national as well as regional users. At present there are 8 national and 17 (17 states) regional users. It is difficult to measure the hours utilised through Edusat as it is a very much user centric approach. The utilisation ranges from 2 hours to 10 hours a day. At times more than one user shares the allocated time for utilisation.

(a) how many hours have been utilized in training of school teachers (teleconferencing mode or otherwise)

At national level our major users are CIET/NCERT for school education and CEC/UGC for higher education. You can contact them either personally or log on to their website to have detailed information. Some of state education departments are using it for teachers' training.

(d) *how many receiving centers/ classroom ends are operational as on date?* At present 1740 SITs and 7854 ROTs have been installed and commissioned across the country.

* National Beam (514 SITs +950 ROTs)

* Regional Beams (1224 SITs + 6904 ROTs) : * **Total (1740 SITs + 7854 ROTs)**

(e) *how many receiving centers/ classroom ends will be ultimately established ?*

As above

(f) *what is exactly the life of this Satellite ?* Seven years but can be starched to 10 years.

(g) *how much will ISRO will charge per hour after this experimental phase is over?*

Till now ISRO has not charged anything from the users. The bandwidth is given free of cost to the users. However, creating and maintaining the infrastructure is the sole responsibility of the users.

(h) ***Do you have any other plan for school education through EDUSAT?***

We are basically technology provider. The effective utilisation of the network, i.e. in terms of hours, kind of utilisation, etc. is the ultimate responsibility of the user (all the people who are involved in the field of education like educationists. Colleges, education departments etc). We can act as a link between the technology and the ultimate users.

Data source: publicatins of DECU (ISRO), Ahmedabad, 2006 and informatins obtained through e-mail

2.6 EDUSAT - its utilization in the CIET (NCERT)

A.

- CIET has paid ISRO Rs. 4 crores, for equipping 100 classroom ends @ Rs. 4 lacs per center
- CIET has entered into an MoU with ISRO (page 97) to avail **free transponder** in this phase. It might be charged (per hour basis) in the next phase
- NCERT has already paid ISRO Rs. 4 crores @ Rs. 4 lacs/centre × 100 centres. On paper 99 centers as in July 2007 are supposed to be operational. Soft - and hardware are in working order hardly in 20 centres as on date (July 2007). Rest (79 centres) are not operational for one reason or other. SIT (Satellite Interactive Terminal: Dish antenna, up- &down linking) of some are non-functional (list attached, pages 87-96). For the entire NE, only 3 centres in Assam was initially identified . Later on, as per CIET's letter F 03-04/05-06/CIET MPD pt. File/945 dt 1.11.2006, 16 more Learning Centres have been identified (Arunachal Pradesh-1, Assam- 7, Manipur-2, Mizoram-1, Meghalaya-2,Tripura-1, Nagaland-1, Sikkim-1)

- For supply of Equipment to the centers, ISRO has contracted out antenna & LAN to M/s INFINIUM and Monitor, Computer hard-& software to M/s CMC.

- Teleconferencing with teachers (about 30 in each of 28 centres) were conducted with CIET at the Teaching End :
  - **(a)** for 36 days, 4 hours a day (6July- 20August, 2006) on NCF-2005, on new NCERT textbooks on 15 various school subjects at different grade levels. The same teacher did not participate for the entire duration, and thus, about 12,000 teachers participated
  - **(b)** for one day each on SSA, Art Education, interaction with Principals and Headmasters of Primary schools. About 1000 Principals and Headmaster participated.

B. What is lacking and what needs immediate intervention:

- About 160 hours of satellite utilization by now is grossly inadequate. Communication to nearly 12000 teachers through satellite assures reaching remotest part of the country through this technology, provided the equipment works and innovative video/ multimedia programmes are planned / produced in advance .
- Proper planning of yearly schedule vis-à-vis content has to be taken up.
- Interactive classroom lessons, interactive multimedia CAL, etc. for each subject for children as well as for teacher training have not yet been even planned. If these are not developed by working overtime and by pooling all resources, the very costly satellite time (which is fortunately free for this phase) will go un/ underutilized
- Nearly 250 video (20- minute) and same quantity of Audio programs have to be developed per year to utilize the satellite even for one hour a day. These programs should be in episode mode for each subject offering interactivity. Though resources are available, CIET's current production level is only 10% of what is desirable
- Computer generated multiple sets of question papers of equal difficulty level, problem solving questions, etc. are to be developed for mass evaluation in this mode
- Research has to be instituted immediately for the areas mentioned above.
- North Eastern states need such connectivity (EDUSAT) more than any other state. But only 19 centres have been identified under the national team. 231 centres under the North Eastern beam have been established in five out of eight states which are grossly under utilised. **Time is running out, as the satellite has already consumed nearly 3 years out of its total expected life of 6 years.**

3. Teachers' Training for the North East

3.1 Status of Teacher Education in the NE

The eligibility criteria for a person aspiring to be a teacher at the elementary level varies from state to state in the NE region. In some states s/he has to be a graduate, while in others s/he has to pass 10 +2 only. In some states a training Diploma/ Certificate like Dip in ETE, Upper Grade Teacher Training, etc are necessary. Some of these teachers' training programs suffer from various discrepancies, as they do not strictly observe NCTE norms. SCERTs. DIETs and other institutes/ centers down upto Block Level Resource Centres do not have proper human resources and proper equipment to use Educational Technology including ICT / IT as a tool in transacting curriculum.

In this region, there is a huge backlog of untrained elementary teachers (more than 50%). Simultaneously appointment of untrained teachers are being carried on.

States	**Course**	**Duration (Yrs.)**	**Eligibility**	**Qualification for recruitment**	
				Aca	Professonal.
Arunachal Pradesh	DPTT	1	10+2 (Tribals) Graduate (Others)	do	Nil
Assam	JBT JBT	1 1	10 (LowerPrimary) 10+2(UpperPrimary)	do do	NIL
Manipur	Dip. in ETE	2	10	10 for L.Primary Grad.for UpperPri.	
Meghalaya	JBT	1	10	10	
Mizoram	Dip. in ETE	1	10+2	10+2	
Nagaland	Jr. TT.	1	8	8	TTC
	UG TTr.	2	10	10	
Sikkim	Pri. Tea Certificate	1	10	10	TTC
Tripura	JBT	1	10	10	BTC

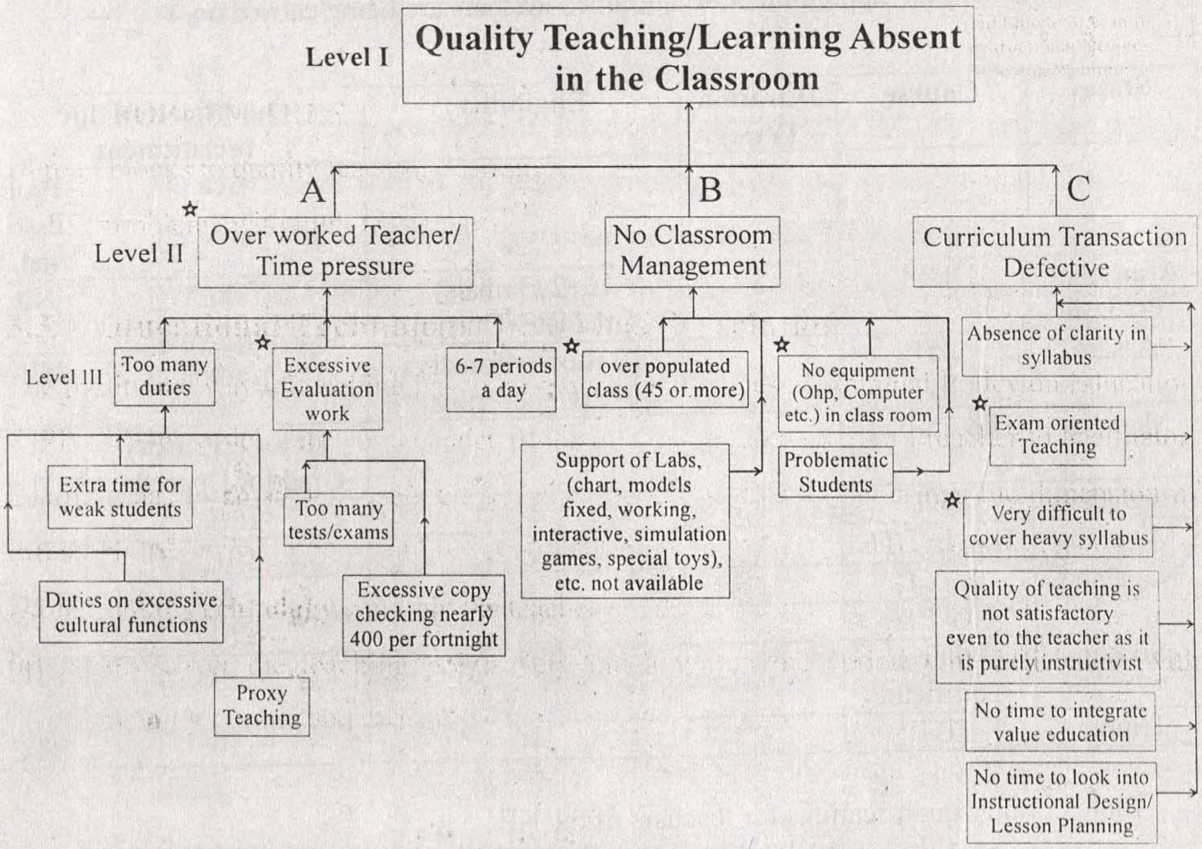
Table3. Entry qualifications for teachers of the NE

3.2 Roadblocks to Quality Teaching

Inputs from practicing Upper Primary & Secondary level teachers were taken and analyzed which led to the construction of the Problem Tree shown in the attached sheet. Harsh negative statements are used (practical situation may be slightly better) to fix the problems. Problems at level III are cause to problems at level II which in turn are causes to the core problem at level I. An average teacher teaching at the. The prominent key problem is the problem of time management. The teacher has to take six or seven periods a day or 35 periods a week. S./he has to talk for almost the entire period and exhaust her/himself totally at the end of the day. Then s/he has to check homework submitted by the students and maintain evaluation records.

The problems with high frequencies are:

Overworked teachers, Examination centred teaching , Very difficult to cover heavy syllabus . The frequencies remain almost constant in inputs from different groups (group size-20) of teachers. Most of the problems could be offset by application of Educational Technology to make teaching more effective and enjoyable.


Level I
Quality Teaching/Learning Absent in the Classroom
A
B
C
Level II
☆ Over worked Teacher/ Time pressure
No Classroom Management
Curriculum Transaction Defective
Level III
Too many duties
☆ Excessive Evaluation work
6-7 periods a day
☆ over populated class (45 or more)
☆ No equipment (Ohp, Computer etc.) in class room
Absence of clarity in syllabus
☆ Exam oriented Teaching
Extra time for weak students
Too many tests/exams
Support of Labs, (chart, models fixed, working, interactive, simulation games, special toys), etc. not available
Problematic Students
☆ Very difficult to cover heavy syllabus
Duties on excessive cultural functions
Excessive copy checking nearly 400 per fortnight
Quality of teaching is not satisfactory even to the teacher as it is purely instructivist
Proxy Teaching
No time to integrate value education
No time to look into Instructional Design/ Lesson Planning

PROBLEM TREE

18 road blocks to quality teaching/learning

* - five problems with high frequency

3.3 Educational Technology (ET) has the solution

The traditional way of teaching has to be refined on the lines of National Policy on Education (NPE – 1986) which calls for a change of the role of the teacher, from Preacher to Facilitator. Learning has to be student- centred and not teacher- centred. This brings the dimension of **interactivity.**

Educational Technology can train the teacher to

(a) fully cover the teaching points very much within the period with efficiency, with economy of time and energy.

(b) make the transaction learner- centred with enough interactivity and collaborative learning. To bring hands-on Science in the Classroom so that learning becomes permanent.

(c) In education, ICT or IT is a tool for implementing Educational Technology. For higher and Technical Education in Universities, IITs and Engineering Colleges, the Ministry of Human Resource Development has been promoting *Technology Enhanced Learning*, which is mainly the application of ICT in learning. Till date application of ICT in learning is yet to seriously enter in the teachers' training curriculum.

In-service teacher training with Educational Technology as a core subject will equip the teaches to conduct **Learner- Centred** classroom with better efficiency and with considerable saving of time and energy. The classroom delivery will be of a quality higher than the same in the traditional system. Each learner in a classroom of 40 will have to interact with her/his group, with the teacher, with the model/ science equipment, with the projection, with the computer and has to exhibit creativity.

The Indian express September 13th 2006 : Arjun moots tech mission in education to Plan panel

In an attempt to ward off criticism for deteriorating education standards, the **HRD Ministry has proposed a National Technology Mission (NTM) for ushering in "technology-driven education"** in country's institutions. A note in this regard has been sent to the Planning Commission.

The note, which went from HRD Minister Arjun Singh's desk early this month, says "there is a felt need to make the wealth of knowledge resources available to all categories of students, formal or informal, self-learners, dropouts or lifelong learners."

HRD's missive to the Plan panel says that **"an NTM needs to be mounted using ICT(information, communication, technology)-enabled platforms towards this end."**

Among the primary objectives of the NTM will be to cater to talent identification, career guidance and personalised nurturing, skill honing and certification, and also to matching jobs and job searchers. The mission can also look at the problems of **"easy accessibility of broadband Internet connectivity to every individual, and also how to make research breakthroughs available at cheaper prices".**

It will have to tackle "connectivity issues using terrestrial and satellite communication channels with a view to bridging the digital divide and bringing in a knowledge revolution among rural communities."

According to senior ministry officials, the NTM can make available facilities for testing and certification. The mission is then expected to help the UPA government's flagship programmes like, among others, the Sarv Shiksha Abhiyan.

The proposal also makes brief mention of HRD's foray into making a "One-Stop Education Portal". The work on the portal, officials say, is underway and is likely to become a major programme to be implemented during the 11th Five-Year-Plan.

The mission, HRD's proposal says, will also have to be backed by various enabling legislative frameworks. "Such a proactive and all encompassing mission should find a prominent mention in the XIth Plan's thrust areas for meeting the identified major challenges in the field of education," it says.

In this connection, the ministry added that **"ICT can be used in a big way in improving the quality of delivery of education at the secondary level.** In the XIth Plan, we must provide assistance to all secondary schools in the country to set up computer labs with broadband connectivity, so that students passing out from here will be active participants in a knowledge economy."

3.3.1 Can EDUSAT cover all teachers in the NE

There are **3,49, 675 teachers** (as per all India School Education Survey) in the NE. Their distribution is shown in Table 1 and Table 2 **(**Pages 29 and 30**)**. Population of teachers in Assam (highest) is more than 26 times of that in Sikkim (lowest). The population of teachers in Arunachal is comparable to that in Sikkim, whereas other states in the NE are 2 to 4 times more populus. Assam is going to receive ten SITs, while Sikkim will receive one under EDUSAT- NCERT network.

It is recommended that in addition to 19 (nineteen) such centres already identified under the NCERT network, 220 more centres have to be identified. These Centres will receive signals from the hub placed at the NERIE – Shillong. The matter was discussed with the NESAC which has already established 231 centres (pages 115-117) with SIT under NE beam in five out of eight NE States. Network will be designed so as to provide services like Digital Video Broadcast, Video Conferencing, Data Communication, Library Network, Internet Access, Information and Documentation Services for teacher training, distance education, conferences, and communications with the learners, inter-institutional network, training extension and other capacity building activities.

EDUSAT can cover 11000 teachers @ 50 teacher–trainees at each centre (total 220) per day; it will cover more if more than 50 teachers could be accomodated in one centre. However, if they come,in turn, on 1-day training programme , all 3,49, 675 teachers will be covered in one month !.

3. 4 A Compulsory ET (including ICT) training Component,

as outlined below, will be integrated with all TT programmes at various levels.

3.4.1 Outline

I Educational Technology – its components

II Technology for Education – I

- (a) Boards, Charts, Graphics, Painting
- (b) Objects and Models, materials and facilities for construction, teaching using models, relia, study kits, diorama
- (c) Different types of projection, overhead projection, photographs and slides

III Learning:

- (a) domains,
- (b) management of learning
- (c) theories
- (d) constructivism
- (e) research findings

IV Technology of Education

- (a) Instructional technology
- (b) lesson plan
- (c) CAL, multimedia courseware, virtual laboratory
- (d) blended learning

V Technology for Education - II

- (a) Radio/Audio
- (b) ETV/video

(c) use of computer in classroom

(d) ICT (information communication technology) in steps – keyboard, components, wordprocessing, d-base, graphics, animation basics, simulation, multimedia creation basics, capturing audio/video, use of internet

(e) e-learning

(f) VLE/LMS

(g) collaborative technology (blogs, broadcasting, wikis, teleconferencing).

3.4.2 Level wise dose of Educational Technology in TT programmes

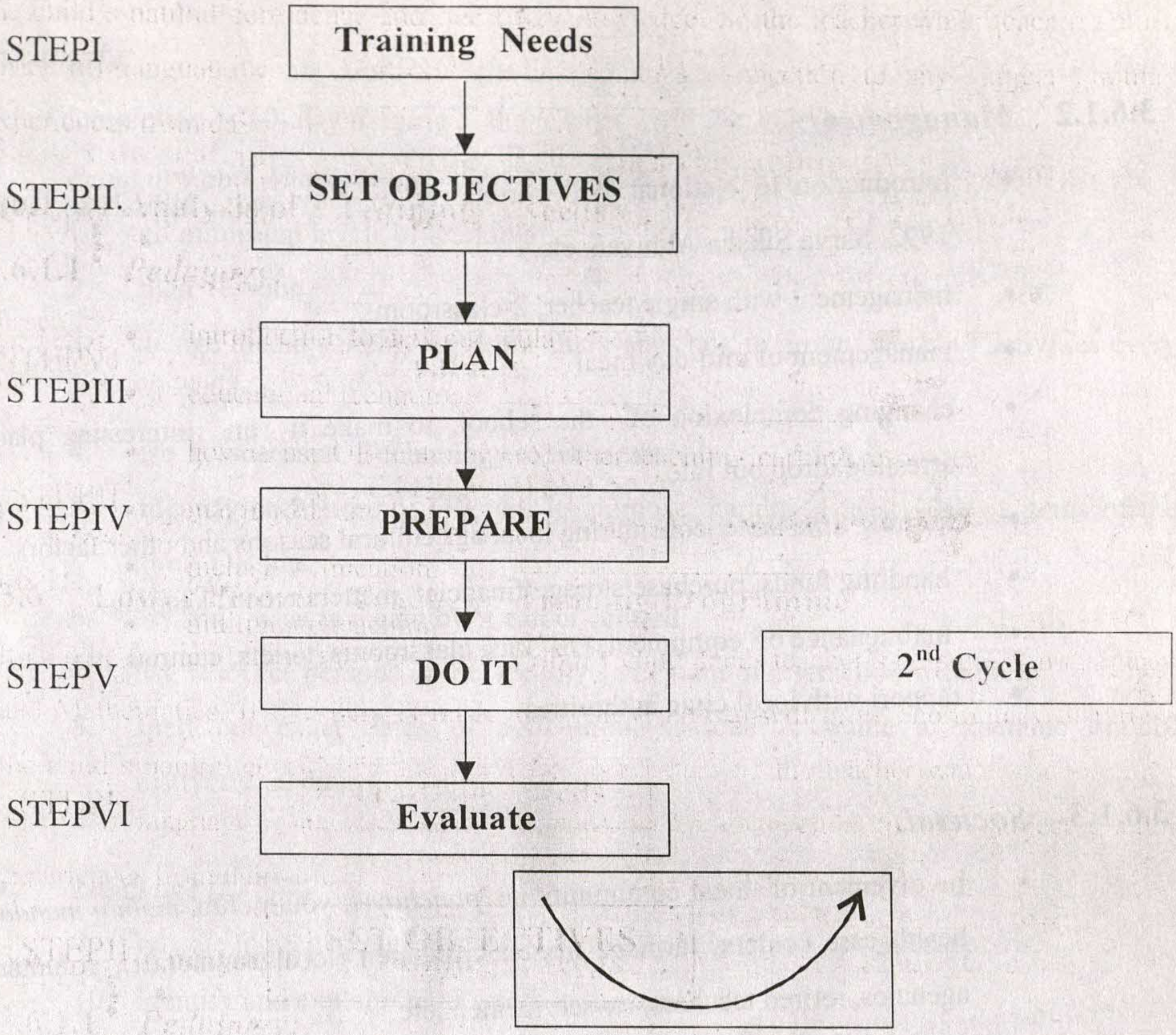
Lower Primary:	Module II – 80%	
	Rudiments of other modules 20%	of ET Time
Upper Primary:	Module II – 60%	
	Rudiments of other modules – 40%	of ET Time
Secondary:	Module IV and V – 50%	
	Other modules – 50%	of ET Time
Senior Seondary:	Module III, IV and V – 60%	
	Other modules – 40%	of ET Time

N.B. **Management of learning** (module IIIb) in the classroom to be made **compulsory** for all levels, as this will include group dynamics, cooperative and collaborative learning, inclusive education, construction of knowledge, leadership qualities, courage to ask questions, learner centred transactions, etc. –

3.5 How to Plan

Teachers' Training Programme

In-service teachers' training should be planned with adequate care so that the trainees demonstrate **observable behavioral change** after the training. The following steps which are based on research are to be followed logically. These steps are elaborated in section 3.6 with examples.



3.6 Lower Primary Teachers' Training Programme

It is to be borne in mind that the Lower Primary child needs teacher's help most in Language and Mathematics. If that help is inadequate, the handicap will grow enormously disturbing the child's natural confidence and quest for knowledge. So the teacher while teaching must make (a) language connection and (b) mathematics connection to any subject quoting experiences from daily life.

3.6.1 Analysis of Training Needs

3.6.1.1 *Pedagogy:*

- introduction to new curricula
- educational technology
- how to use OB materials and other teaching-learning resources
- making EE child centred
- inclusive education
- multigrade teaching

3.6.1.2 *Management:*

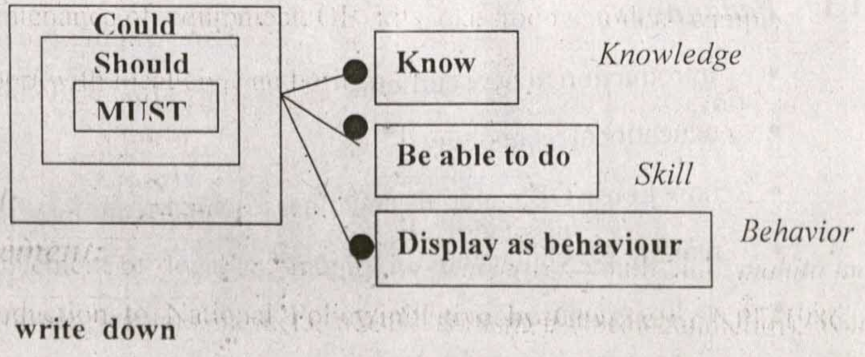
- introduction to National Policy/initiative by Govt. e.g., NPE-1986, POA-1992, Sarva Siksha Abhiyan, etc.
- management with single teacher, 2-classrooms
- management of mid-day meal
- changing complexion of the school; to make it an interesting place, arresting drop out rate.
- framing time table considering local agricultural seasons and other factors
- handling funds, purchase/storage/financial matters/record keeping
- maintenance of equipment, OB kits, classrooms, toilets, campus
- rapport with local civic authorities

3.6.1.3 *Societal:*

- Involvement of local community i.e. *panchayet*, youth club, *mahila mandal*, health care centers, farmers, master craftsmen (local handicraft), voluntary agencies, retired teachers, ex-servicemen.,etc.
- personal touch with parents
- school as the hub of community activities, venue for village theatre, shows, shelter during calamities, etc.

3.6.2 Analysis of Training Objectives

What the trainee



The Planner has to write down

objectives using action verbs and in measurable terms only

Example:

After completion of 10- day training , the teacher will be able to - :

- *Pedagogy and Management (P&M)*
    1. tell minimum levels of learning
    2. plan lessons
    3. change media suitably i.e. from chalk-and- talk to group work to activities every 20 minutes.
    4. use Educational Technology in the classroom
    5. identify each item of OB, tell its purpose, handle at least 10% of items of the three OB kits
    6. explain what is meant by 'Learner centred'
    7. list resource persons in the locality and extent of interaction with them.
    8. spell out exact dates of agricultural seasons & frame a timetable of 220 instructional days

- *Language (L) 30%*
    9. be able to recite loudly,. clearly, correctly at least 10 popular poems.
    10. identify and explain hard spots in the textbooks
    11. conduct role play from the text.
    12. demonstrate story telling professionally; tell at least 10 stories having messages of moral values

        Others: library practice (print, audio, video, multimedia computers), reading habit, radio listening, etc.

- *Socially Useful Productive Work (SU)* 20%
    13. show how to mould chalk sticks and candles.
    14. use Mini Tool kit to fabricate models by cutting, filing, drilling, sawing, etc.
    15. identify, explain common farm implements, their use in farming, gardening, etc.
    16. weave mats from coconut/palm leaves, prepare useful local specific crafts objects with the help of local master craftsmen.

- *Environmental Science (ES) 15%*
    17. perform all activities given in the textbooks

18. identify items of the Primary Science Kit (OB) and set up activities/experiments as given in the handbook/guide

- *Mathematics (M) 15%*

19. identify items of the Mathematics kit (OB) and set up activities from it and the text books
20. collect and assemble locally available materials of daily use to set up activities
21. speak out examples of key mental sums, quote examples from daily life

- *Art Education (AE) 10%*

22. demonstrate clay modeling, work with papier mache, low cost locally available materials
23. demonstrate sketching, painting, work with puppets, masks, role play, individual and cooperative play,
24. sing (with harmonium, tabla); recite at least 10 songs including national anthem

- *Physical and Health Education (PH) 10%*

25. demonstrate good postures, 10 breathing exercises and *yoga asanas,*
26. Spell out details of organizing *Kabadi*, ball games, fitness tips,
27. use of game equipment (OB), regular drill,
28. nutrition and hygiene

3.6.3 PLAN / Time Table

The time allotment for lower Primary subjects and that for 10-day Teacher Training Programme for Lower Primary teachers should be proportionate. Thus time distribution for **10-day Training Programme can be settled as :**

P & M (Pedagogy and Management) – 9 hrs. (15%), L (Language) - 12 hrs. (25%), SUPW 6 hrs. (10%), ES (Env. Science) - 9hrs. (15%), M (Math) - 9 hrs. (15%), A (Art Edu) - 6 hrs (10%), P&H (Physical and Health Edu) - 6hrs. (10%) = **57 hours**

3.6.4 Prepare: Preparation of

(a) venue (with all physical facilities)

(b) training materials: hand outs, transparencies, activity sheets, equipment, kit/hands-on materials, computer presentation/CAL packages – amination, consumable, etc., among others decides the degree of success. An under prepared training programme can't suceed even if the best faculty conducts it.

3.6.5 DO IT : Conducting the training programme as per scheduled plan to bring behaviour change needs total dedication of the faculty and hour-to-hour observation of the mood of the trainees. Humour, anecdotes, interactions are as important as the content. Not to forget that

Total feeling = 7% verbal (content) + 38% vocal(intonation and inflection) + 55% facial (facial expression)

Day	10~ 10-45am	10.45~- 11.30am	11.30- 12.15 am	12.15~1 pm	2--2.45 pm	2.45-3.30 pm	3.30~ 4.15pm	4.15~5pm
1.	P&M1	L6	M1	ES1	ES8	SU6	A6	P & M 11
2.	P&M3	L7	M2	ES2	ES9	SU7	A7	PH 6
3.	P&M4	L8	M3	ES3	ES10	SU8	P&M 10	PH 7
4.	P&M6	L9	M4	ES4	SU1	A1	PH 1	PH 8
5.	P&M.7	L10	M5	ES5	SU2	A 2	PH 2	ES 12
6.	L1	L11	M6	ES6	SU3	ES 11	PH3	M13
7.	L2	L12	M7	ES7	SU4	A3	A 8	M14
8.	L3	L13	M8	M 11	SU5	A4	PH4	M15
9.	L4	L14	M9	M 12	P&M 8	A5	PH 5	M16
10.	L5	L15	M10	L 16	P&M 9	evaluation, valediction		

3.6.6 Evaluate

Distribute evaluation sheets among trainees, faculty. Ask them to fill it up and evaluate on 4-pt. scale. The evaluation sheet must give opportunity to all to speak out weaknesses more than strong points. Have the objectives been achieved? If no, what went wrong? If something went wrong, take care of it in the next cycle.

3.6.7 Resources for corducting teacher training (LP)

OB Package : Primary Sc. Kit (NCERT), mathematics kit, games equipment, musical instruments, teachers handbook, textbook, reference books, etc.,

NB. IGNOU conducts Certificate Cource in Primary Education (CPE) recognised by NCTE for NE region; there are 4 courses

Teaching Language – 3 credits

Teaching Maths – 3 credits

Teaching Env. Studies – 2 credits

Understanding Pri. Sch. Child – 2 credits

Total – 10 credits

Practical

School Based Activities – 2 credits

Workshop Based Activities – 3 credits

Practice of Teaching – 3 credits

Total – 8 credits

Some questions in teacher evaluation :

- What constitutes effective teacher evaluation?
- What are the cutting edge techniques for improving teacher evaluation?
- What are some strategies and processes for improving teacher performance?
- What is the role of technology in teacher evaluation?
- Where does teacher evaluation fit in the accountability picture?
- What are effective techniques for translating theoretical frameworks into practice ?

3.7 Upper Primary Teachers' Training Programme – content and time table

Same six steps as followed for the lower primary stage have to be logically followed. If the training programme is for improvement of Science and Mathematics teaching, most time should be devoted to hands-on activities. It is to be remembered that the untrained or even trained teachers did have hardly any opportunity to do hands-on activities in Science or Mathematics after they had left their college. Number of untrained teachers at the elementary level in the NER is 1,25,000.

Now if the training programme offers them hands-on opportunity, they will consider this to be a great relief from routine vagaries of life in the school and enjoy performing innovating experiments. **This will certainly bring about a major behavioural change**. In the training programme they will have to work in groups; so when they go back to the classroom after receiving training, they will see to it that children also do hands-on activities in groups of 4 to 6. For this, apparatus and materials for hands-on activities on chapters of the text book have to be prearranged on laboratory tables (stations). For example, station-1 may have 10 activities (list to be pasted on the table) and required apparatus and materials. Station-6 may have all materials for constructing triangles and finding out sum of internal angles of each triangle. Each group will visit each station by rotation. Hence the timetable will have

(a)	Hands-on activities in groups, interaction, and group reporting (trainee lectures, the whole class interacts)	60%
(b)	Educational Technology (as in section 3.4.1. and 3.4.2)	20%
(c)	Problem solving/problem posing	10%
(d)	Lecture, demo-lecture by experts	10%

The design of such a training programme, which has been conducted many times with total success and evaluated very favourably by the participant teachers, is given at pages 123-137. This tested design may be adopted in all such training programmes.

3.7.1 **Resource materials:**

Integrated Science Kit (NCERT), Mini Tool Kit (NCERT), low cost materials locally available, various equipment/apparatus/instruments/kits from market, charts, models, chemicals, glassware, ruler, equipment/kit for learning mathematics, computer, interactive CAL packages, Teachers' Handbook, manuals, textbooks, etc.

3.8 **Higher Secondary and Secondary Teachers' Training Programme on Science and Mathematics -**

Number of untrained teachers at Secondary and H.S Stages in the NE region are 48,853 and 9048 respectively (total - 57901). As elementary teachers' training gets priority face-to-face training of H.S. and Secondary teachers followed up by 10 – day teleconferencing over NCERT - EDUSAT network may continue from the NERIE (NCERT) budget.

However such training programmes in Science and Mathematics need be conducted on the lines of section 3.7 with the exception that the computer will be used extensively for learning hard spots in Science and Mathematics in an interactive manner. Such interactive multimedia packages have to be developed by in-house expertise. Some such lessons are also available with animation in many websites. The organizers have to identify and retrieve those for use in the training programme.

Mathematics look very easy even for a slow learner in interactive CAL programmes like 'Turtle'. Such packages are to be used as resource materials.

'Virtual Laboratory' on Computer is yet another powerful tool facilitating laboratory experiments in the virtual environment. Highly interactive simulation programme make the trainee totally conversant with procedure, precaution, control of variables, statistical analysis, drawing graph and making inference. Once the student does laboratory experiments in this mode, s/he becomes a mature person to perform real experiments in the real laboratory.

3.8.1 Resource materials

In addition to those at 3.7.1, equipment, apparatus and consumables for standard experiments as prescribed by respective boards will be required.

3.8.2 Director (NCERT) suggests that outstanding H.S and Secondary teachers could be groomed to become KRPs (Key Resource Persons) to train elementary science and Mathematics teachers. Such block level / cluster level talents are to be drawn and trained in university and college laboratories. By this, quality of training thousands of elementary teachers could be improved.

3.9 Plan & Budget for In-Service Teachers Training for the NE Region

In-service TT programme to be conducted by NERIE should consider the requirement of each state as reflected in their perspective plans submitted to the NEC (on Science and Mathematics) for Teacher Training through 'face-to-face' and EDUSAT modes.

3.9A. In-Service Teachers Training for Elementary (Lower Primary & Upper Primary) untrained teachers

		Lacs
A.1	Focus Group Meeting (3-day) on selection of content and resource materials : Face-to-face	3.14 (ref. 3.9B, A.1)

A.2	Development of Training materials (5-day workshop)	0.90 (ref. 3.9B, A.2)
A.3	Preparation of KRPs (Key Resource Persons) from States (10-day Training : face-to-face : 40 KRPs from each State @ Rs. 4 lacs × 8 such Trg. progs. (to be followed by EDUSAT/Radio/Web, postal, print material)	32.00 (ref. 3.9B, A.3)
A. 4	**Training of RPs and Teachers:** budget for the first year only	3000.00 (ref. 3.9B, A.4)

Trg. of Resource persons and teachers ;

Venue - Respective State Capital

- 10-day trg. prog. to be divided into level I (5 days) & level II (5 days)
- 1 KRP (Key Resource Persons) to prepare 20 RPs
- 1 RP (Resource Person) to train 20 teachers
- one centre means one training centre at DIET or any other such place with training facilities including SIT/RoT (EDUSAT)
- one centre will accommodate 20 training programmes of 5-day duration in a year of 220 working days

A.4.1 At the end of First year

(i) Assam (82,908 untrained elementary teachers)
To have 20 centres, each to conduct
10 trg. progs. for preparing 200 RPs (20 × 10) only at one centre
followed by 10 trg. progs. for 200 teachers (20 × 10)
So, 20 centres will train 8000 teachers (20 centres × 20 progs. × 20 teachers) ***400 progs***

(ii) Meghalaya (11,452 untrained elementary teachers)
Same as Assam : 8000 teachers trained ***400 progs.***

(iii) Tripura (6,700 untrained elementary teachers) ***200 progs.***
10 centres × 20 progs. × 20 teachers = 4000 teachers trained

(iv) Manipur (6,400 untrained elementary teachers) ***200 progs.***
10 centres × 20 progs. × 20 teachers = 4000 teachers trained

(v) Sikkim (6,280 untrained elementary teachers) ***200 progs.***

10 centres × 20 progs. × 20 teachers = 4000 teachers trained

(iv) Mizoram (3,948 untrained elementary teachers) *200 progs.*

10 centres × 20 progs. × 20 teachers = **all teachers covered (level I)**

(v) Nagaland (3,884 untrained elementary teachers) *200 progs.*

10 centres × 20 progs. × 20 teachers = **all teachers covered (level I)**

(vi) Arunachal Pradesh (3,326 untrained) *200 progs.*

10 centres × 20 progs. × 20 teachers = **all teachers covered (level I)**

Total *2000 progs.*

Each training programme will cost similar to that at A.3(expenditure for TA/DA will be similar). But, Honoraria to experts will be less

So, cost of each training programme will be - 1.5 lacs

Total cost of 2000 trg. progs. = 2000 × 1.5 lacs **Rs. 3000 lacs, or**

Rs. 30 crores

A.4.2 At the end of 2nd year

(i) Assam 50 centres

50 centres × 20 progs. × 30 teachers = 30,000 teachers *1000 progs.*

(ii) Meghalaya *300 progs.*

30 centres × 10 progs. × 20 teachers = 11,452 teachers
(all teachers covered at level I)

(iii) Tripura *200 progs.*
20 centres × 10 progs. × 20 teachers = 6,700 teachers
(all teachers covered at level I)

(iv) Manipur *200 progs.*
20 centres × 10 progs. × 20 teachers = 6,400 teachers
(all teachers covered at level I)

(v) Sikkim *200 progs.*

20 centres × 10 progs. × 20 teachers = 6,280 teachers

(all teachers covered at level I)

Total 1900 progs.

(vi) Mizoram
all teachers already covered over dist. made
i.e. EDUSAT/Radio/ web/postal (at Level II)

(vii) Nagaland
all teachers already covered over dist. made i.e. EDUSAT/Radio/ web/postal
(at Level II)

(viii) Arunachal

all teachers already covered over distt. mode
i.e. EDUSAT/Radio/web/postal (at Level II)
Cost (2^{nd} year) = Rs. 2850 lacs = Rs 28 crores 50 lacs.

A.4.3 At the end of 3rd Year

(i) Assam
100 centres × 17 programms × 30 teachers

1700 progs

= 51,000 teachers trained ; all teachers are covered (at level I)

(ii) Meghalaya
all teachers already covered over distt. mode, i.e. EDUSAT/ Radio web/postal (at Level II)

(iii) Tripura
all teachers already covered over distt. mode, i.e. EDUSAT/ Radio web/postal (at Level II)

(iv) Mizoram all teachers already covered over distt. mode, i.e. EDUSAT/ Radio web/postal (at Level II)

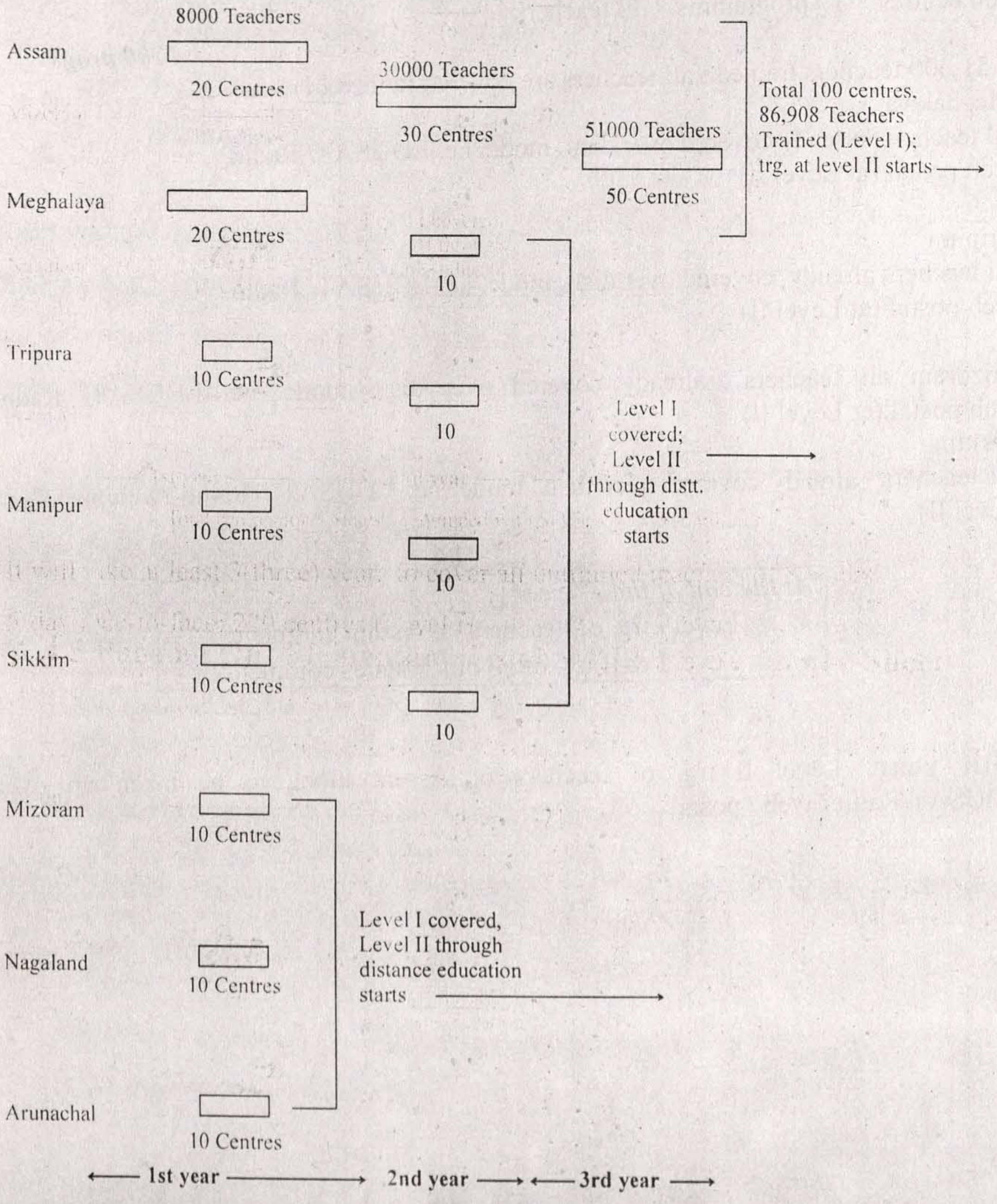
(v) Sikkim
all teachers already covered over distt. mode, i.e. EDUSAT / Radio /web/postal (at Level II)

At the end of the 3rd year ,

- Level I trg. of teachers of Assam complete
- Level I & II trg. of all other states complete

A.4.4 4th year: Level II trg. of teachers of Assam alone to be taken up over EDUSAT/Radio/ web / postal

A.4.5 Phasing Out Elementary Teachers' Trg. : Summary Sheet



Total centres for 8 States to equipped with SIT are — 220 (minimum)

It will take at least 3(three) years to cover all untrained teachers of 8 states:

5-day face-to-face: 220 centres (Level I)

3.9B.1 Detailed BUDGET break up for elementary teachers' training

A.1 Focus Group Meeting (3 day) on Selection of Content and Resource Materials

Venue - NERIE Shillong

Collection of syllabus and books from NE states (Identification of content areas) and discussion with concerned authority. Procurement of relevant material from NCERT, IGNOU, SCERTs, UNESCO, and other similar agencies and discussions with experts in the field.

S. No.	Item	*Estimated expenditure in Rs*
1.	Syllabus and books @ Rs. 3000	24,000
	Books and relevant materials (science kits, CDs, etc.)	50,000
2.	- TA and DA for two persons @ Rs. 30000 per person from Delhi	60,000
	- TA & DA for 2 persons from each of 8 states	1,60,000
3.	Miscellaneous	20,000
	TOTAL	**Rs. 3,14,000**

A.2. Development of Training Material (5- day workshop)

Venue : NERIE - Shillong

S. No.	**Item**	***Estimated expenditure in Rs***
1.	TA & DA to 10 Experts and honorarium @ Rs 500 to 10 experts and 5 NERIE faculty	50,000
2.	Breakfast	2,000
3.	Lunch	5,000
	Tea	2,000
4.	Word Processing, Printing, Binding, etc.	20,000
5.	Miscellaneous	11,000
	TOTAL	**90,000**

A.3 Preparation of KRPs (Key Resource Persons) from states in face-to-face mode

10 days, with experts from NCERT, IGNOU and state representatives (from SCERT, DIET, State Boards, etc.) : 40 KRPs from each NE State, Venue NERIE - Shillong

S. No.	Item	*Estimated expenditure in Rs*
1.	TA & DA & honorarium to Experts from NCERT, IGNOU etc.	2,00,000
2.	TA and DA for 20 KRPs from respective state/zone	1,00,000
3.	Breakfast	12,000
4.	Lunch	24,000
5.	Tea and Snacks	4,000
6.	Training materials to KRPs @ 500 × 40	20,000
7.	Miscellaneous (hiring of generator, OHP, LCDP, rooms and halls at the venue, chart paper, marker pen, sketch pen, drinking water, banner, photography, fuel, local conveyance, papers, Xerox of training material, CDs, floppies, computer typing, laboratory equipment etc.)	40,000
	TOTAL	**4,00,000**

40 (Forty) KRPs from each of 8 states will be prepared, firstly through face-to-face during 10-day training at NERIE - Shillong and then through EDUSAT, radio, web, postal, etc. .

Each KRP will train at least 20 Resource Persons (RPs) at SCERT/DIET/College of Education located in the concerned state for 5 days (face-to-face, level-I) followed up by lessons (level II) through radio, EDUSAT, postal, etc.

Each RP will train at least 20 Teachers at SCERT/DIET/College of Education located in the concerned state for 5 days in face-to-face mode (level I of training) followed up by lessons through EDUSAT, radio, postal, etc. (level II of training)

3.9B.2 Training of Secondary and High Secondary Teachers (Science & Mathematics)

No fresh budget for first three years, over and above the same received by NERIE from the NCERT is required. Other details are same as in section 3.8.

3.9C Miscellaneous Expenditure

1.	Preparation of Database/e-communication	Lacs
	a. 6 Computers/laptops	4.20
	b. 6 Computer Assistants/Operators @ 5000 p.m.	3.60
	c. Broad Band Connection (for web-based activities)	2.00
	d. Software	2.00
	e. Printers (2), peripherals	0.30
2.	Stationary for office and training centres (files papers, pens, etc.)	5.00
3.	One Digital Camera for use in training	0.15
4.	TA/DA for co-ordinators/staff for visiting training centres.	3.00
5.	Library of resource materials : interactive CDs/Video/Audio, books/journals	0.75
	TOTAL	**21.00**

3.9.D Management of In-Service Teacher Training

Data base

(i) d-base of KRPs, RPs, teachers already trained to be maintained along with some evaluation. Outstanding teachers could be used as KRP/RP for future programmmes.

(ii) d-base of all training Centres with comments on facilities, record of each training programme including evaluation, strength and weaknesses, etc. are to be maintained

(iii) d-base of all on-going in-service Teacher Training Programmes (subject, duration, affiliation, degree awarding or not, free or not, etc.) being offered by various universities/bodies/boards in the NE region to be created.

d-base of all certificate/diploma/degree programmes (meant for school teachers at various levels) of Universities/ boards of NER is to be created along with curriculum, textbooks, resource materials, etc.

4. Educational Technology (ET) Centre/ building for NERIE- Shillong

4.1 Building Plan

The plan at page 76 shows the basic requirement for starting ET/ Audio- Video Production, teleconferencing,etc. However the space requirement, etc. for each activity should be incorporated in the construction of the permanent building for the NERIE to come up at Barapani.

4.2 Studios for Video and Audio Production

Video Studio

The layouts for the Video studio have been given at pages 77-79. Out of the three models shown, ***Model-I is preferred over the other two***; though at low end, but it is very much user-friendly , utilitarian and value –for-money equipment for **educational video**

***Audio Studio* :**

To be ready with wall panelling / sound proofing, airconditioning

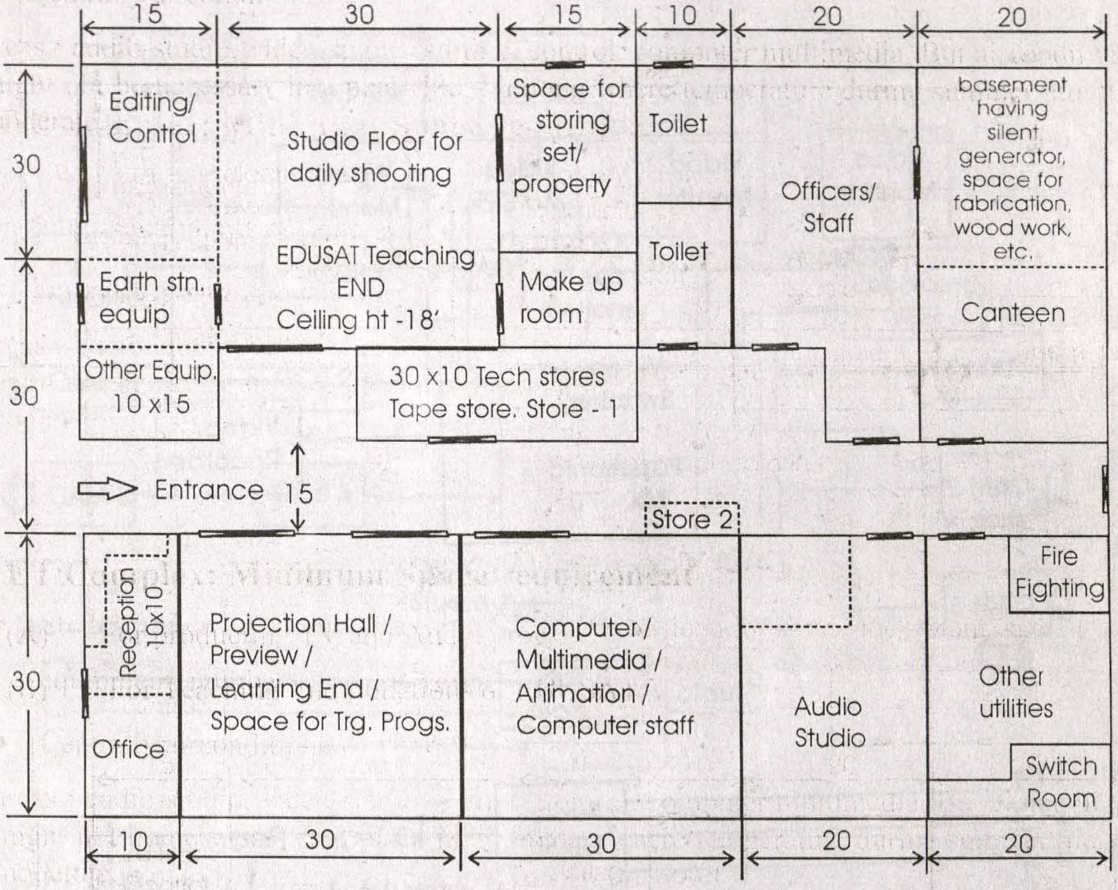
8 – track Digital Recorder	3 lacs
Digital Audio Mixer	6 ,,
NLE for Audio editing, CD/DVD recording	6 ”
UPS, Furniture / Misc.	5 ,,

	Rs. 20 lacs

ET Complex: Minimum Space requirement

(A) For producting TV and Audio progs.

(B) For Teaching End Functions of EDUSAT


15
30
15
10
20
20
Editing/ Control
Studio Floor for daily shooting
Space for storing set/ property
Toilet
Officers/ Staff
basement having silent generator, space for fabrication, wood work, etc.
30
Earth stn. equip
EDUSAT Teaching END Ceiling ht -18'
Make up room
Toilet
Canteen
Other Equip. 10 x15
30
30 x10 Tech stores Tape store. Store - 1
Entrance
15
Store 2
Reception 10x10
Projection Hall / Preview / Learning End / Space for Trg. Progs.
Computer / Multimedia / Animation / Computer staff
Audio Studio
Fire Fighting
Other utilities
Switch Room
30
Office
10
30
30
20
20

All dimensions are in ft.

Area = 110' x 90'
= 9900 sq. ft.
Say, 10000 sqft.

Note:

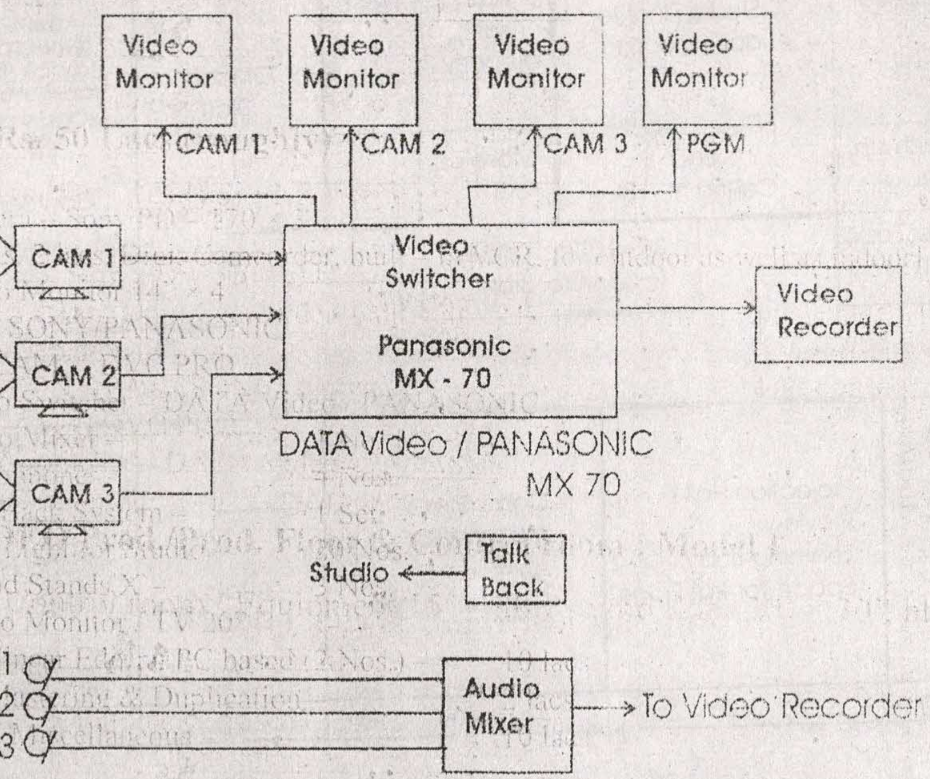
- Studios might take more space considering provisions for sound lock room, size of equipment, number of operators, etc.
- Centrally airconditioned

areas : audio-studio, video-studio, editing, control, computer multimedia. But airconditioning might not be necessary in a place like Shillong where temperature during summer months is moderate.

ET/VIDEO Prod./Prod. Floor & Control room : Model I

Space : Control room / Equipment 15’ × 20’, studio floor 30’ × 30’, ht 18’ min.

Cool lights – 20, split ACs – 5.



Budget Rs. 50 Lacs (roughly)

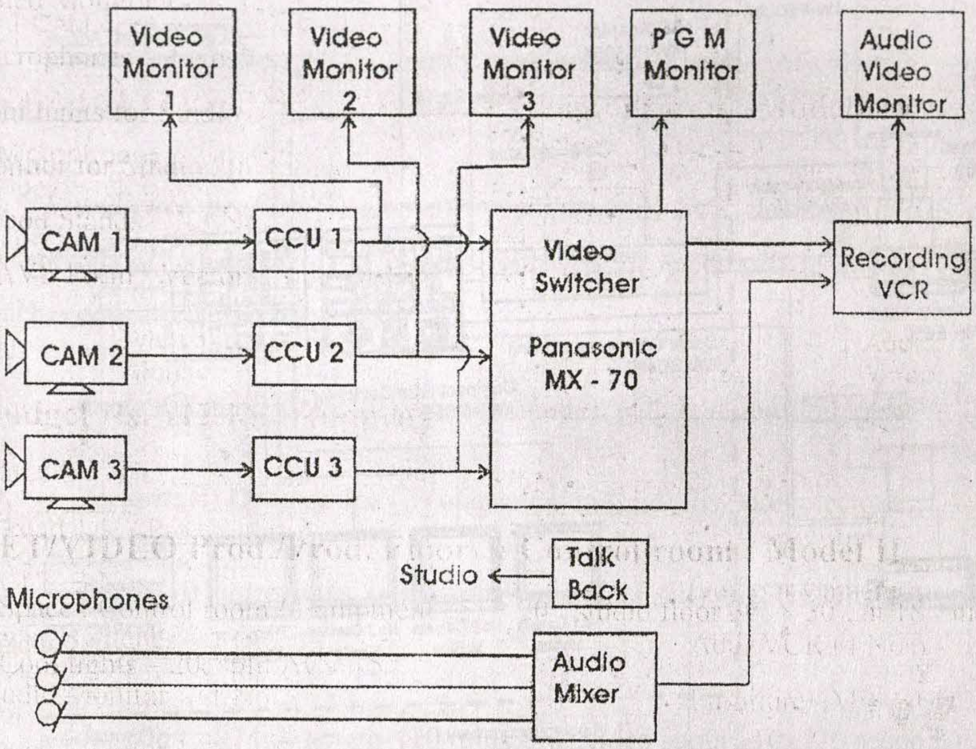
- Camera – Sony PD – 170 × 3
  [@ Rs. 2 lacs, Digi, Camcorder, built – in VCR, for outdoor as well as indoor]
- Video Monitor 14” × 4
- VCR SONY/PANASONIC
  DV CAM DVC PRO
- Video Switcher – DATA Video / PANASONIC
- Audio Mixer – 1 No.
- Microphones – 4 Nos.
- Talk Back System – 1 Set
- Cool Light for Studio – 20 Nos.
- Tripod Stands X – 3 Nos.
- Studio Monitor / TV 20”
- Non linear Editing PC based (2 Nos.) – 10 lacs
- CD Mastering & Duplication – 2 lacs

Furniture / Miscellaneous – 10 lacs

ET/VIDEO Prod./Prod. Floor & Control room : Model II

Space : Control room / Equipment 15' × 20', studio floor 30' × 30', ht 18' min.

Cool lights – 20, split ACs – 5



Budget Rs. 112 Lacs (approx)

Camera – Sony D X D-50 – 3 Sets @ Rs. 8 lacs

(Broad cast / Pro. quality)

CCU – 3 Nos.

Video Switches – 1 No.

Audio Monitor – 1 No.

Video Monitor 14" - 3 Nos.

Microphones – 4 Nos.

Cool lights for Studio – 20 Nos

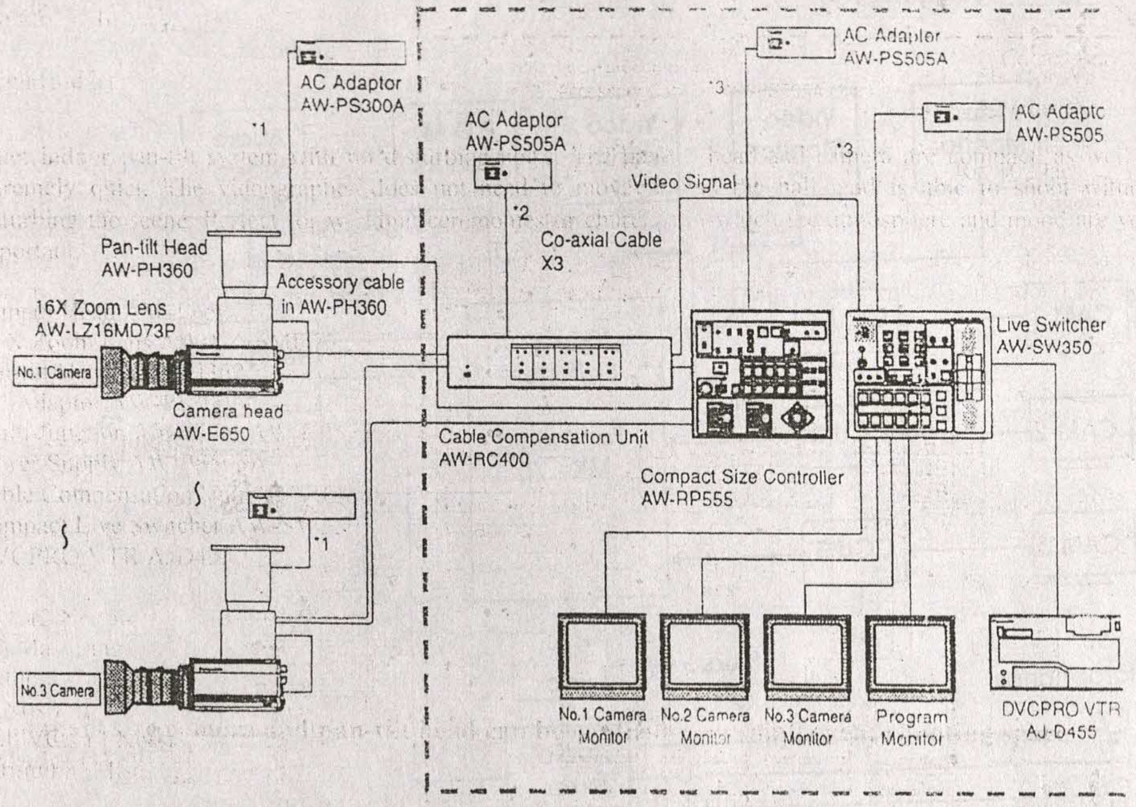
Monitor for Studio 20" – 1 No.

Tripod Stands – X3 Nos.

WAVE Form / Vector Scope – 1 No.

NLE (2 Nos) -	10 lacs
CD Mastering	2 lacs
Outdoor Camera -	5 lacs
Addl VCR (4 Nos) -	20 lacs
Furniture / Misc -	15 lacs
Total :	Rs 112 lacs (approx)

Compact size camera and pan-tilt head can be controlled in small event shooting space
Model III



*1 Local procurement
*2 Accessory Cable in AW-PS505A (3 m)

Quiet indoor pan-tilt system with no disturbing noise. The pan-tilt head and camera are compact, as well as extremely quiet. The videographer does not need to move around the hall, and is able to shoot without disturbing the scene. Perfect for wedding ceremonies or churches in which the atmosphere and mood are very important.

A.

Camera Head AW-E650
16 X Zoom Lens AW-LZ16MD73
Pan-tilt Head AW-PH360
AC Adaptor AW-PS300A 50 lacs
Multi-function Controller AW-RP555
Power Supply AW-PS505A
Cable Compensation Unit AW-RC400
Compact Live Switcher AW-SW350
DVCPRO VTR AJD455

B	**Lacs**
NLE (2 Nos.) -	10
CD Mastering -	2
Outdoor Camera - (2 Nos.)	5
Adl. VCR (4 Nos.)	20
Furniture / Misc	15
	Rs. 52

Rough Budget
50 (for A)
+ 52 (for B)

Rs. 102 lacs

4.3 Designs of Video/ Audio Programmes to be generated

The format for ETV production for EDUSAT for uniformity of production by CIET-SIET-NIOS-RIEs and other school level progs. may be standardised on the following lines :

A. *curricular/others*: (i) purely curricular,(ii) extra-curricular,(iii) enrichment, (iv) edutainment

B. ***audience profile***: (i) elementary children,(ii) Sec. children,(iii)HS children, (iv) Out-of-school children (v) Children with special needs (vi) teachers, (vii) parents, (viii) teacher educators & policy makers

C. *mode* :(i) stand alone (ii) episode mode (with continuity/linkage)

D. *format:* (i) Docu drama (ii) magazine/ mosaic (iii) purely lecture

E. *events*: (i) interviews, (ii)coverage of events ,(iii)quiz, (iv)teleconferencing, (iv) panel discussion

F. *duration* : (i) full length (20 mins.),(ii) video spots (10 – 20 seconds) ,(iii) promos

4.4 How many video programmes (20 min) per month

For feeding the EDUSAT channel with Video programs for 18 hours a day,3 repeats a day and 4 repeats a year, NERIE/SIET/CIET / Hub has to be immediately ready with a minimum of 1620 (each 20- min duration) programs in hand
(18 progs will occupy 18x 20/60 hours = 6 hours per day , to be repeated 3 times, no. of programs required for one month will be =18x30 = 540;
no. programs required for 3 months will be =540.x3 =**1620 progs**)

If it looks impossible under typical resource problems, we may think of transmitting over EDUSAT only for 2 hours a day ; for this the Institute will have to generate 1620 / 3 = 540 video programs in advance.

Annual Budget Calculation

Non-Recurring

Sl.	Particulars	Rs. (Lac)
1.	**EDUSAT:** One SIT Internal hub at NERIE-Shillong (231 SITs on NE beam are already installed in 5 NE states)	70
2.(a)	Video-Studio: ET Model I	50
(b)	Audio Studio	20
3.	Computer, Animation, etc.	15
4.	LCD projector, ohp, office equipment	5
5.	Addition/alteration in the bldg., studio wall panelling/sound proofing, air conditioning, set making, property, etc.	30
6.	Educational kits, models, puppetry/animated objects, etc.	2
7.	1 Generator, fire fighting, 2 vans	30
Total (non-recurring)		**222**

Recurring

8	**Salary of ET Staff, 23 Contract posts** Three Video Producers – 36,000 p.m. One Camera control staff-Technician – 8,000 p.m. One video recording-Technician – 8,000 p.m. One Audio Producer – 10,000 p.m. One sound recordist -Technician – 8,000 p.m. Three Camera Persons – 30,000 p.m. One vision mixing person-Technician – 8,000 p.m. One Maintenance Staff -Technician – 8,000 p.m. One Lightman-Technician – 6,000 p.m. Two Artists – 16,000 p.m. Two Storekeepers – 12,000 p.m. Six Helpers – 24,000 p.m. **Total** **174,000 × 12 = 21 lacs (approx)**	21

9.	4(four) Advisors/consultants with background of design-development of school level Science & Technology equipment/experiments & their use in Teachers' Training, development of multimedia CAL, virtual lab, among other applications of ET in TT	20
10.	(a) Hiring ET building/complex 10,000 sft. @ Rs. 80,000 p.m (b) Electricity	10.00 1.00
11.	(a) Outstanding Audio, Video, CAL Progs. (b) Purchase for inhouse activities	30.00
12.	**Training cost (1st year)** I. 3-day Focus Group Meeting : A1 5-day Development of training materials : A2 Training of KRPs : 40 from each state :10 days at NERIE: A3 II. Training of RPs and untrained teachers of 8 States : 5 days face-to-face: A4 Miscellaneous (3.9C)	 3.14* 0.90* 32.00* 3000.00 21.00*
Total (recurring)		**3139.04**

*A1, A2, A3, Misc. (3.9c) will be borne by NCERT to start with i.e. Rs.57.04 lacs will come from NCERT budget.

Non-recurring - 2 crores 22 lacs
Recurring - 31 crores 39.04 lacs
Total 33 crore 61.04 lacs

***NEC will fund Rs.3361.04 (–)Rs.57.04 i.e. 33 crores 04 lacs (in the first year)**

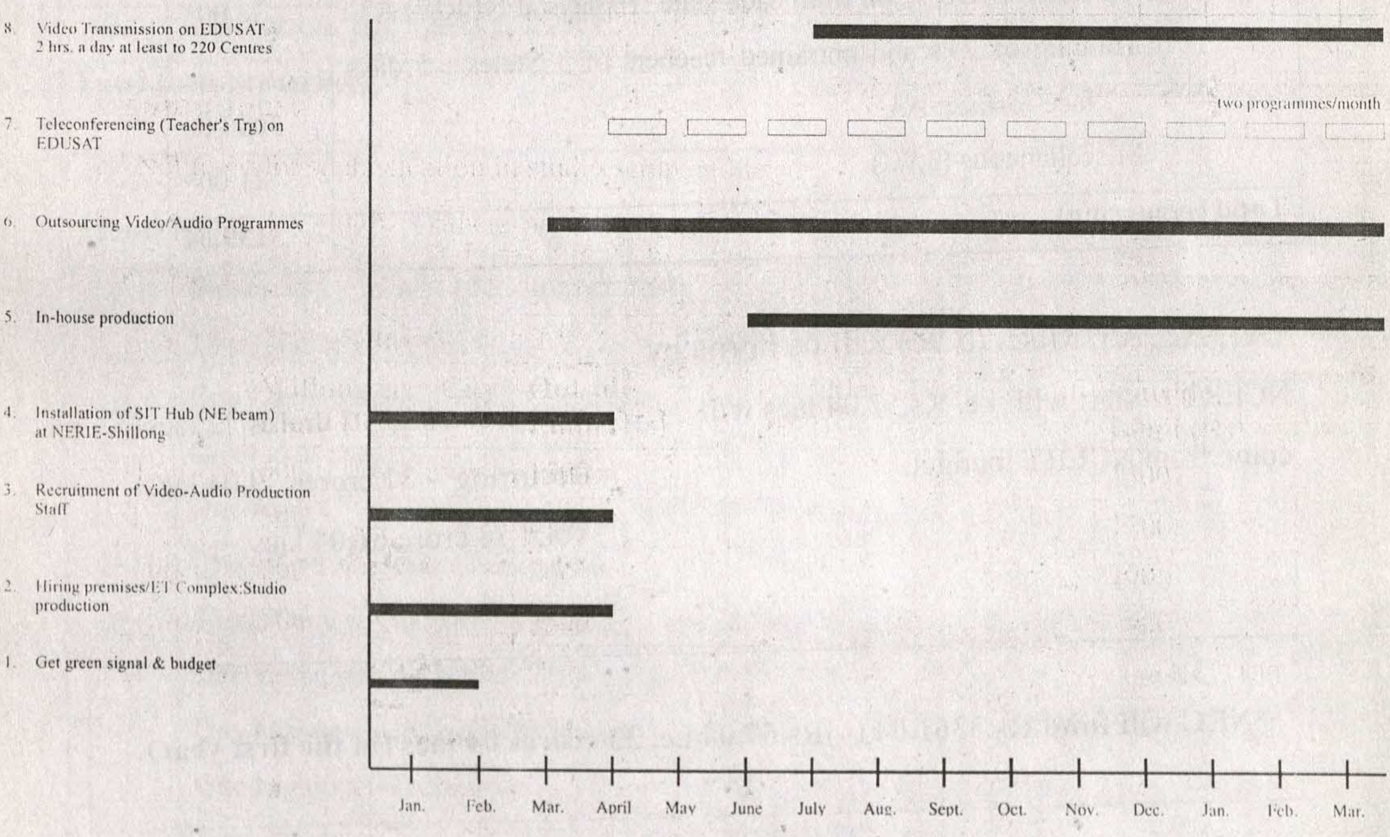
Assumptions:

(a) Not to go for sophistication in studio setup, at the start

(b) Average TA + DA + others per participant for 5/day and 10/day Teachers' Training is shown below:

	5-day		10-day	
	Within City Limit (Rs)	**Outside Limit (Rs)**	**Within City Limit (Rs)**	**Outside Limit (Rs)**
TA	500	1500	1100	1500
DA	Nil	600	Nil	1200
Others	200	200	200	200
Total	700	2300	1300	2900
	Average Rs. 1500			**Average Rs. 2100**

SIMPLIFIED PERT CHART



5. Annual Budget and PERT for TT Progs on EDUSAT and face-to-face at NERIE- Shillong

5.1 Plan and Budget have been shown at pages 81, 82

A recurring budget for Rs. 31 crores 39.04 lacs (annually) and a non- recurring budget for Rs. 2 crores 22 lacs have been asked for, with the assumption that a building for Educational Technology activities will be taken on rent till the permanent building at Barapani is ready. Other assumptions are given at page

5.2 Simplified PERT

The PERT Chart at page 83 shows the dates by which the activities are to be executed. The activities shown could be further broken into sub – activities. The details have to be worked out by the executives. By and large, the Educational Technology Complex has to be made operational within 6 months, **so as to gainfully utilise the EDUSAT**.

6. Recommendations:

6.1 As 231 centres under NE spot beam have already been established by ISRO in 5 out of 8 states (Arunachal - 50, Meghalaya - 50, Mizoram 31, Nagaland - 50, Tripura - 50) immediate transmission of programmes, teleconferencing, etc. should start from NERIE - Shillong which will contact these states to identify:

(a) types of teacher training programmes to complement / supplement / bring new dimensions to existing teachers' training programmes.

(b) time slot

6.2 For this, one SIT (NE spot beam) has to be installed immediately at NERIE by the ISRO. NESAC has agreed to this proposal in the meeting on 27.06.2007 held at the office of the Director - NESAC, Barapani (pages 115-117). A budget of Rs. 70 lacs for this could be provided by the NEC/NEREC as reflected in the budget proposal in this Report.

6.3 ISRO has to install SITs/RoTs at Assam, Nagaland, Sikkim on the lines of 6.1. Assam should get priority as it has the highest population of teachers. The number of untrained teachers in Assam at elementary level is 82,908, at Secondary level -35,816 and at H.S. level - 5015, (total : 1,23,739 untrained teachers)

6.4 40 Key Resource Persons (KRPs) from each of 8 states have to be trained for 10 days (face-to-face) at NERIE - Shillong. They will further train Resource Persons and teachers at the elementary level. NCERT should release budget for this (Rs. 57.04 lacs, page 81, 82). This training will be complemented/supplemented/reinforced by subsequent teleconferencing, radio, web casting, postal etc.

6.5 (a) These KRPs will train RPs (Resource Persons) and teachers in cascade model as explained in section 3.9 (page 68-71). Level I of his training at 220 centres (5 days) dotted all over NE region will be in face-to-face mode followed up by modes of teleconferencing, web casting, radio, postal, etc.

(b) It will require one year to cover untrained teachers of Mizoram, Nagaland, Arunachal Pradesh in face-to-face mode (5-day, level I) at 10 centres in each of the three states. In the second year these states will introduce distance mode (level II). e.g. EDUSAT, radio, webcasting, postal, etc.

(c) Meghalaya, Tripura, Manipur, Sikkim will require two years to reach the stage as at (b). In the third year these states will introduce distance mode (level II)

(d) Assam will require 3 years to reach the stage at (b) above.

The details have been shown at pages 68 - 71.

6.6 (a) NERIE-Shillong should telecast video progs. over EDUSAT for at least 2 hours a day, to start with. For this the NERIE has to generate/procure 540 video programmes (of 20 minute duration) in advance.

(b) NERIE-Shillong should also broadcast lessons over FM radio, FM radio being capable of deeper penetration.

6.7 NERIE - Shillong has to concentrate on in-service teacher training only to start with and not on reaching students directly in the classrooms. As there is no time slot in school time-table for viewing TV in the classroom, it will be a mistake to reach classroom directly at this stage.

The entire population of teachers of NE region is 3,49,675. Reaching each and every teacher through EDUSAT is now within striking distance; provided SIT/RoT centres are commissioned at Assam, Nagaland and Sikkim over and above those 231 centres already equipped with SIT/RoT facilities.

6.8 Budget and PERT chart have been shown at pages 81-83. NEC should release 33 crores 04 lacs (for the first year) to meet the expenditure detailed at pages 81-82. Training of

40,000 elementary teachers (100 centres, 2000 face-to-face programmes @ 5 days each) in the first year will alone cost Rs. 30 crores.

6.9 Training of H.S. and Secondary teachers should continue in the face-to-face and teleconferencing modes over the national beam (NCERT-EDUSAT) to the 15 (fifteen) equipped centres in the NE region with the NCERT budget. But priority should be fixed in training of elementary teachers.

6.10 Outstanding H.S. and Secondary teachers could be groomed to become KRPs (Key Resource Persons) to train elementary Science and Mathematics teachers. Such block level/cluster level talents are to be drawn and trained at the university and college laboratories. By this the quality of training of thousands of elementary teachers could be improved.

6.11 The designs of inservice teachers' training programmes for lower primary teachers and upper primary teachers are given at pages 60-64 and pages 65, 66, 123-137. These designs should be adopted in all such in-service teachers' training programmes.

6.12 Educational Technology (including ICT) should be made a compulsory component of in-service teachers' training at all school levels. Brief ET curriculum is given at pages 58, 59.

6.13 The success of in-service teacher training programme depends on the motivation of teachers. Extrinsic motivation by way of awarding a certificate (which will be useful for getting promotion/increment) by any university/academic body is worth exploring. One year B.Ed (Correspondence) for all such practicing teachers could be initiated with the approval of NEC, Universities of the NER region, MHRD.

For this, 5-day or 10-day face-to-face training programme should be supplemented by further lessons/enrichment through EDUSAT/radio, web, postal. Continuous evaluation of each trainee has to be recorded and monitored. Ultimately they will have to take a test/examination (preferably on computer). The examining body will use computer generated multiple sets of question papers of equal difficulty level, so that administration of examination is hassle free, fair and quick.

7. The next phase

The workplan in this report is the very first phase of the project. Detailed planning for sustainability has to be taken up once work in the first phase in taken up.

Time is running out as life of the EDUSAT is only

6 years. It is already three years old

Annex.1

TOTAL 50 + 1 CIET SITES

FIRST LIST (ISRO) 2006

SN	CONTACT PERSON	SITE ADDRESS
1.	Principal	Kendriya Vidhyalaya, No. 3, Macheswar, Rly Colony, Bhubaneshwar.
2.	Sh. Pratap Aditya Mishra, Director	State Institute of Educational Telchnology, P.O. Sainic School, Near Doordarshan Kendra, Bhuvneshwar
3.	Prof.U.Sinha Principal	Regional Institute of Education, Bhubaneswar, Orissa.
4.	Mr. Manoj Jain	Regional Director, YMCA Complex, Sector-11C, Chandigarh-160011
5.	Mrs.Harsh Batra Principal	State Institute of Educational, Sector-32, Administration Chandigarh-0172.
6.	Mrs.S.P.Shergil Principal	Kendriya Vidyalaya, Sector-31, Chandigarh-160030.
7.	Sh.P.S.Kansal	Assistant Director, Navodaya Leadership Institute, JNV Campus, Sec.25, Chandigarh
8.	Sh.Sanjay Kumar Ojha, Director	State Council of Educational Research and Training (SCERT), DIET Campus, Raipur, Chattisgarh.
9.	Dr.Neelam Sinha	Regional Director, NIOS, A24/25 Institutional Area Sector-62, NOIDA (U.P)
10.	Production Division	Central Institute of Technology (CIET), Chacha Nehru Bhavan, Sri Aurobindo Marg, New Delhi-110016.
11.	Dr.U.C.Gupta, Educational Office	Central Tibetan Schools Administration, ESS BSS Plaza, Community Centre, Sector-3, Rohini, Delhi.
12.	Sh.R.K.Arya, Joint Director (Media)	National Institute of Open Schooling, A-38 Kailash Colony, New Delhi.
13.	Dr.(Ms.) Janaki Ranjan, Director	State Council of Educational Research and Training (SCERT), Varun Marg, defence Colony, New Delhi.
14.	Principal	Kendriya Vidyalaya, JNU Campus. New Mehrauli Road, New Delhi.
15.	Smt. Nirmal Lether, Director	State Council of Educational Research and Training (SCERT), Gurgaon
16.	Principal	Kendriya Vidyalaya, No. 1, GCF, Jabalpur.
17.	Principal	Kendriya Vidyalaya, N. 1, Bhopal, Opposite Central India Flour Mills, Hoshangabad Road, P.O. Sikshamandal, Bhopal.
18.	Prof. M. Sengupta, Principal	Regional Institute of Education, Shymala Hills, Bhopal
19.	Prof. S.J.Haider, Joint Director	PSS Central Institute of Vocational Education, M.P. Nagar-II, Bhopal.
20.	Sh. A.N.Tiwari,	State Education Centre, Pustak Bhavan, R-Wing, Area Hills, Bhopal-462011

	Commissioner	
21.	Principal	Kendriya Vidyalaya, No. 1, Jaipur, Bajaj Nagar, Jaipur.
22.	Prof. A.B. Saxena, Principal	Regional Institute of Education, Pushkar Road, Ajmer
23.	Sh.D.P. Choudhry	Head Master, Demonstration School RIE, Ajmer Rajasthan-305004.
24.	Sh. S.U.Sorte, Regional Officer	Regional Officer Central Board of Secondary Education, Todarmal Marg, Ajmer-35001
25.	Sh. Motila Jharotia Regional Director	Regional Director, NIOS Regional Centre 34, Vijay Path Tilak Nagar, Jaipur-302004
26.	Sh. S.B. Jadav Principal	Kendriya Vidyalaya, Sector-J, Aliganj, Lucknow-22724
27.	Sh. Kuldeep Puri, Director	State Institute of Educational Technology, Nishat Ganj, Lucknow.
28.	Sh. D.S.Khati Principal	Kendriya Vidyalaya, Upper Camp, Birpur, Dehraduncant-248003
29.	Sh.N.N.Pandey Addl. Director	State Council of Educational Research and Training (SCERT) Tihri Garhwal, Old Collectorate Bhavan, Narender Nagar, Uttaranchal.
30.	Sh.M.V.V.Prasada Rao	House No. 17/26, Sree Nagar Colony, Road No.5, Dilsukh Nagar, Hyderabad
31.	Sh.B.Amar Kumar	State Institute of Educational Technology, Ramanthapur, Hyderabad
32.	Smt. Praniti Suhasini Kavoori	Director, State Council of Educational Research and Training (SCERT), Opp. Lal Bhadur Shastri Stadiam, East Gate, Fathe Maidan Hyderabad.
33.	Principal	Kendriya Vidyalaya, Picket,, Secunderabad.
34.	Sh.S.V.Reddappa	Asstt. Director, Navodaya Leadership Institute, JNV Rangareddy, HCU Campus, Gachchbowli, Dist. Rangareddy-50046.
35.	Sh.Ms. Shangra, Principal	Central School for Tibetans, Bylakuppe, District-Mysore.
36.	Principal	Kendriya Vidyalaya, Bangalore-560023.
37.	Sh. Ratan Kumari Sinha, Principal	Jawahar Navodaya Vidyalaya, Bangalore-562149.
38.	Dr.Babu Sebstien	Director, State Institute of Educational Technology, Tagore Nagar, T.N.F.5, Cotton Hill Square, Thyeaud P.O. Vazhuttacaud, Thiruvanthpuram-14-695014.
39.	Mr.Ravi Kumar Section Director	Regional Director, 34/2740, Ist & 2nd Floor, Regional Director, Mamangalam, Palarivattom P.O. Kochi-682025.
40.	Director	State Council of Education Research and Training, (SCERT), Poojapora, Thiruvananthpuram, Kerala.
41.	Sh.S.S.Rajendra Principal	Kendriya Vidyalaya, IIT-Campus, Chennai-600036

42.	Dr. Terumalsamy	Director I/C, Director of Teacher Education Research and Training (DTERT), College Road, Chennnai
43.	Sh. S.Radha Krishna	Navodaya Leadership Institute, Canacona, South Goa-403702.
44.	SIE. Goa	State Institute of Education, Alto-Porvomon, Goa.
45.	sh. V.D.Sevakar	C/o National Institute of Education, 128/2, J.P. Naik Road, Kothrud, Pune-411038.
46.	Sh.C.Mani Principal	Kendriya Vidyalaya, NCH Colony, LB Shastri Marg, Bhandup (Kanjur Marg West), Mumbai-40078.
47.	Shri Vasant Kalpande	State Institute of Educational Technology, Agarkar Marg, Pune.
48.	Principal	Kendriya Vidyalaya, Sector-30, Gandhinagar.
49.	Sh. Suman V. Patel	Gujarat Institute of Educational Technology, Drive-in-cinema Road, Near Manav Mandir, Ahmedabad.
50.	Dr.N.I.Pandit, Director	Gujarat Council of Educational Research and Training (GCERT), Sector 21, Vidya Bhavan, Opp. Udyog Bhavan, Gandhinagar
		Teaching end setup
51.	Production Division	Central Institute of Technology (CIET), Chacha Nehru Bhavan, Sri Aurobindo Marg, New Delhi-110016.

SECOND LIST (ISRO) 2006

SN	STATE	CONTACT PERSON	SITE ADDRESS	CONTACT NUMBER	INSTALLATION STATUS	REMARKS
1.	**Bihar**	Sh. Sanjay Sinha	Regional Director, Lalit Bhavan, Ground Floor, Patna	0612-2236551	System Installation completed	SIT connectivity problem
2.	**Bihar**	Sh. Bhupesh Singhvi Director	State Institute of Educational Technology, Mahendru, Patna	2370092	System Installation completed, SIT connectivity problem	SIT connectivity problem
3.	**Bihar**	Principal	Kendriya Vidyalaya, Patna No. 1, Kankarbagh, Patna.	0612-2353788	Installation completed	
4.	**West Bengal**	Dr.R.S.P. Singh	Kendriya Vidyalaya No.1, Salt Lake, EB Block, Labony Sector 1, Kolkata.	033-23371242, 9830385052	Installation completed	
5.	**West Bengal**	Principal New Name: Mr.M.P.Saxena	Regional Director, 10/1/H, Diamond Harbour Road, Kolkata.	033-24797714	System Installation completed	
6.	**West Bengal**	Dr. Rabindra Nath Dey, Director	State Council of Educational Research and Training (SCERT), 25/3, Ballygunj, Circular Road, Calcutta, WB-700019.	033-24754377, 24765114(fax)	Installation completed	
7.	**Bihar**	Mr. Ravindraram - Director / Tejnarayan Prasad - Engineer / Gopal singh - engineer - SUDHIR KUMAR SINHA (Dilip Kumar Bharti)	State Council of Educational Research and Training Director, SCERT, Mahendru, Patna-800006	0672-2370783, 2671783 (Telefax) - 09835293464		Material rejected by customer 5 times, now material is returned back to XPS Ahmedabad.
8.	**Orissa**	Mr. Akahileswar Mishra	Head Master, Demonstration Multipurpose School RIE Sachivalaya Marg, Bhubaneshwar-751022	0674-2541516	Installation completed	
9.	**Orissa**	Mr. Sebak Tripathi	State Council of Educational Research and Training Gopa Bandhu Nagar, Bhubaneshwar-751001.	Fax:0674-2402928, 0674-2502928	Installation completed	Material is received by Costomer few days back, as road permit letter was pending from customer.
10.	**Assam**	Sh. R.Sarma, New Name: Mr.R.D.Mahapatra.	Regional Director, National Institute of Open Schooling, Room No. 101, Nilomoni Bhavan, Ist Floor, Nilomoni Phukan Road, Christian Basti, Guwahati-781005.	0361-2343964 0361-2340497	System Installation Completed	SIT Not installed
11.	**Assam**	Mr.K.K.Choudhury, Regional Officer	Regional Officer Central Board of Secondary Education, Rajgarh Road Rajgarh Tinali Guwahati-781003.	0361-254092 0361-2547276 Fax:541092	Installation completed	
12.	**Assam**	New Name: Ms. Joyshree Das Basu	Kendriya Vidyalaya, Khanpura, Guwahati-22.	0361-2361062 0361-2367400	Installation completed	

13.	**Himachal Pradesh**	Name: Mr. Satish Chandra Sharma	State Council of Educational Research and Training (SCERT), Rabon Solan	01792-228135	Installation completed	
14.	**Uttar Pradesh**	Sh. Nikunj Prakash Narayan (9335135304)	Regional Director, 19/17 Kasturba Gandhi Marg, Kachari Road, Allahabad-211002.	0532-2548149 0532-2548150, 0532-2548154(D)	Installation completed	
15.	**New State: Haryana**	Mr.D.R.Yadav Regional Officer	New Address: CBSE, Sector 5, Panchkula, Opp: Shichal Bhavan, Haryana-134109	Old Ph No.0172-2606184 0172-2606291 0172-2604248 Fax:91172-2604248 New Ph.No.:0172-2585193, 2585163 (Fax)	Installation completed	Note: Earlier Site was not ready and Engineer was not allowed to install system, when he visited location number of time, Customer was of the view "Who is CMC to ask us get machine installed on time". It was pressure from Mr. Rajendra Kumar from CIET.
16.	**MP**	Mr. Prakash Shrivastav	Head Master: Demonstration School, RIE Shamla Hills Bhopal-462013.	0755-2661219	Machine delivered	Customer is not allowing CMC engineer for instalaltión. As per him site is not ready. Until then time installation has to be kept pending. He is not signing installation report, now status is he is not allowing CMC persons to even visit him, he is also.
17.	**Delhi**	New Name: Ved Prakash	Director , NIEPA, NCERT Campus, 17-B, Sri Aurobindo Marg, New Delhi-110016.	011-26965996, 011-26518218	Installation completed	Note: Within NCERT group this location was not aware of the fact that they are part of CIET network. They got machine verified, but we not willing to install machine, later again our engineer was asked to installed system once they got approval
18.	**Delhi**	New Contact Person: Ms. Sadhna Parashar (M) 9811491725 Educational Officer	Old Address: CBSE, 2, Community Centre, Preet Vihar, Delhi-92,New Address: 17-B, Rouse Avenue, Delhi	Fax:9111-2215826, New No:01123212603, 22459734, 23220155	Installation Completed	Note: First time engineer has installaed system and demonstrated video conferencing to location head. Later concerned engineer visited and asked CMC to install setup at other localtion and was asking CMC to provide all the infrastructure needed for it.
19.	**Delhi**	Sh. Prem Singh	Assistant Director, Commissioner, Kendriya Vidyalaya Sangathan 18, Institutional Area, Shaheed	011-26858566-71 Fax:91-11-26514179	Installation completed	

			Jeet Singh Marg, New Delhi-110016.			
20.	**Delhi**	Sh. H.N.S. Rao Deputy Director	Deputy Director, Navodaya Vidyalaya Samiti, A-28 Kailash Colony, New Delhi-48.	011-26424162 Fax:011-26424151	Installation completed	
21.	**Punjab**	New Name: Baldev Singh Sidhu	State Council of Educational Research and Training Shop-cum-office complex 66-67 Sector 17-A, Chandigarh-160017.	0172-2703221 0172-2702793	Installation completed	Note engineer has to visit number of time as time was not ready from customer site
22.	**Rajasthan**		State Council of Educational Research and Training, 111, Saheli Marg, Udaipur-313001 Rajasthan.	0294-2560693	Installation completed	
23.	**Uttar Pradesh**	Mr. Rajbir, Regional Officer	New Address: CBSE, 35-B, Civil Station, M.G. Marg, Civilianse, Allahabad	Old No.:0532-2605710 0532-2633568, 0532-2633948 New No.:0532-2602970,71,72	System Installation completed	SIT connectivity problem
24.	**Uttar Pradesh**	Mrs. Khanna	State Council of Educational Research and Training J.B.T.C. Campus Nishant Ganj, Lucknow-226007, U.P.	0522-2780385 Fax:0522-2781125	Installation completed	
25.	**Jammu & Kashmir**	Principal New Name: Mr.A.S.Gill	Kendriya Vidyalaya, No.1, Gandhinagar, Jammu	0191-2430137	Installation Pending	Material delivery is pending as all required document needed for clearance was submitted, but still as entry tax some 4000/-INR is being paid to get material cleared, soon it is going to get delivered.
26.	**Jammu & Kashmir**	Sh. Lalit Kr. Guta	Jt. Director (Training) and Principal, State Institute of Education, Kanal Road, Jammu.	0191-2547718, 2586062(R)	Installation pending, our engineer visited place for inspection and found that this oganization has shifted to new place and local security office does know where this organisation is shifted	Material delivery is pending as all required document needed for clearance was submitted, but still as entry tax some 4000/-INR is being paid to get material cleared, soon it is going to get delivered.
27.	**Karnataka**	Prof.Ravinder / Mrs.Rekha, Mr. Phaulchandra-9845480433 bphalachandra@yahoo.co.in	Regional Institute of Education, Manas Gangothri, Mysore-6.	Ph:0821-2514095, 2416721, 2515665	Installation completed	
			Head Mistress,			

28.	**Karnataka**		Demonstration School RIE, Manasagangotri, Mysore	0821-2512570	Installation completed	
29.	**Tamil Nadu**	Sh. R.N. Magam, Regional Officer, New Name: Ms. Neelam	Regional Officer: Plot No. 1630A, Block 15th Main Road Anna Nagar West Chennai.	044-26162213, 044-26280102 Fax:91-44-6280102	Installation completed	

30.	**Maharashtra**	Sh.Santosh S. Kakan, New Name: Ms. Kale	Deputy Director, 708, R.D. Kumthekar Marg, sadashiv Peth, Pune-411030.	020-24476938 (Extn. 322) Fax:020-24477290	Instalation completed	
		Issued at other locations				
	1.	SIE Goa			Entire driver set and OS has been misplaced, now they are asking our engineer to reprovide the same	
	2.	KV Bhubneshwar			Video confercing not working, because PC was shifted to other room and now CIET wants them to join Video conferencing so they want to get reinstalled at proper , location as per their System is in bad shape, lot of DUST is on all equipment set.	

Annex.2

List of EDUSAT sites : Fully Completed Sites: NE States

Source: CIET/25.06.07

S.No.	State	Contact Person	Site Address	Contact Number	Remarks
1.	Assam	Mr.D.R.K.K. Choundary Regional Officer	Regional Officer Central Board of Secondary Education, Rajgarh Road Rajjgarh Tinali Guwahati-781003	0361-254092 0361-2547276 Fax:541092	Site Completed
2.	Assam	Principal M.S. Joyshree Das Basu	Kendriya Vidyalaya, Khanpura, Guwahati-22	0361-2361062 0361-2367400	Site Completed

For latest status please see remarks column

S.No.	SITE CODE	STATE	CONTACT PERSON	SITE ADDRESS	CONTACT NUMBER	REMARKS
3.	223-NE-AS-CIET-064	Assam	Principal	Kendriya Vidyalaya, Silchar	03842-245417	Site Completed
4.	224-NE-AS-CIET-065	Assam	Sh. Manphool Singh, Princkpal New Principal : Sh. S.f. Rahman	Jawahar Navodaya Vidyalaya, Mukalmua, Distt. Morigaon, Assam.	03624-286417	Site Completed
5.	229-NE-MN-CIET-068	Manipur	Sh.P.Sharat Chandra, Commissioner	State Council of Education Research and Training (SCERT), D.M. Collage Campus, Imphal West, Manipur.	Mr.Ashok Khalem. (M)9863134428	Site completed
6.	230-NE-MN-CIET-069	Manipur	Sh. Udhob Singh, Principal	Jawahar Navodaya Vidyalaya, Khumbong, P.O. Langjing, Distt. Imphal West, Manipur	0385-2569202	Site completed
7.	240-NE-MG-CIET 0-072	Meghalaya	Officer on Special Duty, D.S. Bhattacharya Principal	North East Regional Institute of Education, Jowal Road, Fruit Garden, Laitumakhrah, Shillong, New Building: Nongrim Hills Road, Opp: Assam Rifles House	0364-2522747, 48, 0364-226359, Mr. Prasad (9863080485)	Site completed

8.	233-NE-MZ-CIET 0-070	Mizoram	Smt. Sangdhanmawan, JD (SE)	State Counsil of Educational Research and Training (SCERT) Aizawal	9436141445, 9436141815, Fax:0389-2347790	Site completed
9.	092-SS-PN-CIET 00-032	PONDICHERRY	Sh.G.Rajasekaran	District Institute and Educational Training, Pondicherry		Site Completed

Source CIET/25.06.07

List of EDUSAT sites : SITs not Installed : NE States

Source:CIET/25.06.07

S.No.	SITE CODE	STATE	CONTACT PERSON	SITE ADDRESS	CONTACT NUMBER	REMARKS
1.	223-NE-AS-CIET-064	Assam	Sh. R. Sharma	Regional Director, National Institute of Open Schooling, Room No. 101, Nilomoni Bhavan, Ist Floor	0361-2343964	Materials reached at site. This site was surveyed and terrace was fixed for ODU installation. However owner has refused to use terrace. Customer has requested for one more site survey considering ODU installation on Ground. Infinlum will do site survey again before material reaches.
2.	224-NE-AS-CIET-065	Assam	Sh.H.K. Sharma Director	State Council of Educational Research and Training (SCERT), Khaillipara, Guwahati 19 Assam		ROAD PERMIT NOT RECEIVED. CIET HQ has to provide contract No. and to request to customer to send RP.
3.	229-NE-AS-CIET-0-068	Assam	BY CIET, Delhi	State Institute of Educational Jorhat, Assam.		SITE UP ONLY HOLD BY CIET, NEW DELHI
4.	230-NE-MN-CIET-069	Meghalaya	Sh.L.Roy, Director	Director of Education Research and Training (DERT), Arbuthnot Road, Nogrimmaw, Laitumkhrah Shillong, Meghalaya.		EQUIPMENTS DISPATCHED. Our team visited site on 30.5.06. As co-ordinator replaced, no one is known about Edusat terminal.
5.	240-NE-MG-CIET 0-072	NAGALAND	Dr. Vipralhou Kesiezle, Director	State Council of Educational Research and Training, DD, SCERT, Kohima, 797001 Nagaland	0370-2270160 037-2270432 Fax:0370-2260852	HOLD FROM CUSTOMER (Customer wants SIT to be installed on new Building). It is under hold since Diwall.

6.	233-NE-MZ-CIET 0-070	Sikkim	Mr. K.K.Pradhan Deputy Director	State Counsil of Educational Research and Training DD, (SCERT) TATANGCHEN RIDGE, p/o Raj Bhavan, Gangtok-737103	03592-202585 Fax:03592-202585	Material dispatched on 19.01.07
7.	092-SS-PN-CIET 00-032	TRIPURA	Mo, Bhattacharjee Addl. Secy. to the Govt. of Tripura	State Institute of Educational, P.O. Abhay Nagar, Agartala, Tripura.	09436452730 (Ambalika Dutta Madam) 0381-2354867.	ROAD PERMIT NOT RECEIVED

Source CIET/25.06.07

Annex.3

MEMORANDUM OF UNDERSTANDING

BETWEEN

NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING (MINISTRY OF HUMAN RESOURCE DEVELOPMENT, GOVT. OF INDIA)

AND

INDIAN SPACE RESEARCH ORGANISATION (DEPARTMENT OF SPACE, GOVERNMENT OF INDIA)

FOR

CO-OPERATION IN THE FIELD OF SATELLITE BASED COMMUNICATIONS NETWORK FOR TRAINING, EDUCATION AND DEVELOPMENT

MEMORANDUM OF UNDERSTANDING

The Memorandum of Understanding (MoU) entered into this thirty first day of March 2004 between NCERT (Ministry of Human Resources Development), New Delhi represented by its Director) hereinafter known as CIET, NCERT of the one part and Indian Space Research Organisation, Department of Space, Govt. of India) represented by Director, Development & Educational Communication Unit (DECU), Ahmedabad (hereafter known as ISRO of the other part).

Whereas

Central Institute of Educational Technology (CIET) which is an important and integrated unit of NCERT, develops contents for elementary and secondary level satellite based audio and video programmes. It coordinates programmes development activities of the seven State Institutes of Educational Technology (SIETs) located at Lucknow, Patna, Hyderabad, Ahmedabad, Pune, Bhubaneswar and Thiruvananthapuram. The project was initiated by Ministry of Human Resources Development (MHRD). The CIET of NCERT has requirement of setting up Satellite Based network for services like distance learning through direct telecasts, video conferencing, file transfer and internet access etc. In India covering RIEs, SCERTs, SIETs, in the first phase which shall be expanded to include DIETs and institutes of other sister organizations viz. NIOS, KVS, NVS, CBSE, Boards of School Education etc. at the national level involved in producing and/or dissemination of educational programmes and training of personnel in the school education sector.

Network will be designed so as to provide services like Digital Video Broadcast, Video Conferencing, Data Communication, Library Network, Internet Access, Information and Documentation Services for teacher training, distance education, information communication and management, tele-meetings and tele-conferences, and communications with the learners, inter-institutional network, training, extension and other capacity building activities.

And whereas

ISRO has the primary objective to promote the development and applications of space technology for the socio-economic benefit of the nation, ISRO training and development communication channel (TDCC) on INSAT (providing one-way video and two-way audio interactive teleconferencing network) is operational in the area of distant education. The TDCC and Jhabua Development Communication Project (JDCP) initiatives are spreading to many other states in the country under ISRO's GRAMSAT Project (GP) with the involvement of State governments; the SATCOM networks are being set up at the state level connecting the state capital to districts and blocks and enabling a reach to villages

- Arrange for recurring expenditure/operations at the CIET after the network is established.

(ii) ISRO shall be responsible for the following:

- Establishment of hardware and software as required by the ISRO in consultation with CIET of NCERT.
- Installation, commissioning and arranging maintenance of equipment at all locations during warranty and extended warranty period.
- Necessary clearance from the government agencies
- Making available satellite transponder and help in establishment of a relevant teaching hub at the CIET, NCERT.
- Consultancy, technical guidance, and support for system engineering and design at the network.

(c) A mechanism for mutual consultation and to recommend appropriate technology / software / hardware and system configuration based on ground needs and capabilities, is to be established.

(d) The network will be owned and operated by CIET of NCERT and utilized by the CIET and other NCERT departments. Other educational institutions will also be invited to utilize the network facilities as per norms worked out by NCERT, ISRO shall assist and guide in conceptualizing and designing the network (i.e. to define hardware configuration and systems parameters and to help in designing the relevant software elements for effective utilization of the network). The funding (Capital / Fixed and Recurring / Operational) shall be provided by the NCERT.

Section 3 : Funding

The total funding for the network setup, operations, and utilization etc. shall be provided by the NCERT. It shall transfer to ISRO initially Rs. 4.0 (four) crore for procurement of hardware for installation. The subsequent release of funds will be made as and when required.

Section 8 : Alteration

This MoU may be mutual consent in writing, be altered, amended or substituted from time to time during the term of this agreement at the hands of duly authorized representatives of the parties.

Section 9: Effective Date of Agreement

This MoU shall be effective from the date first above written.

NCERT and ISRO have caused this MoU to be executed as of the day and year first above written.

For and on Behalf of NCERT Sri Aurobindo Marg New Delhi-110016	For and On Behalf of Indian Space Research Organisation Department of Space
Authorised Signatory	*Authorised Signatory*
(Anil Kapoor) Secretary, NCERT Sri Aurobindo Marg, *New Delhi-110016*	(B.S. Bhatia) Director, DECU/ISRO P.O. Ambavadi Vistar Ahmedabad-380 015
Ph: 26519153	Ph: 6763954/6773120
Fax: 26868419	Fax: 6768556

Witness:

1.

2.

Annex.4

Office of the Entquiry Officer

When I visited the NERIE in Shillong, I could not meet Shri P.P.Srivastava, Member of the North Eastern Council as he was away on leave. Subsequently, he called on me at the NCERT to give me his views on restructuring the NCERT.

2. After the discussion about the 'review', I raised a point about assistance to the NERIE from NEC. Shri Srivastava responded very positively to this suggestion. Two specific points emerged as follows:

(i) NEC funding establishment of Educational Technology facilities on a regional basis at the NERIE. Besides the capital cost involved, this funding can also encompass operational expenses for a stated initial period.

(ii) The NEC will readily accept a proposal for clearing the backlog of teacher-training in the North Eastern States with the help of satellite technology.

3. The NEC, however, cannot take the initiative in this regard. Detailed proposals will have to be formulated and submitted to the NEC by the NERIE. Since the NEC has constituted a Study-Group on 'Education', it will be helpful if the NERIE can liase with the Group to have its proposals endorsed by them.

4. You may recall that I had verbally apprised you of this development some time ago. Unfortunately, I failed to send you this note to formalise the matter. The purpose of this note is to fill up this omission so that you can set in process such action as may be necessary to have these proposals submitted to the NEC in case this idea is acceptable to the NCERT.

(S.Sathyam)
Enquiry Officer
10 April 06

Secretary, NCERT

Annex.5

प्रमोद प्रकाश श्रीवास्तव

सदस्य, उत्तर पूर्वी परिषद

P.P.Shrivastav

Member NEC
Tel: 0364-2522642

उत्तर पूर्वी परिषद सचिवालय

शिलांग - 793 003

N E C Secretariat

Shillong - 793 003
Fax:0364-2522666

DO No. P/NEREC dated 5th May 07

Dear Dr. Krishna Kumar,

It was a pleasure to have met you on the 30th April. Discussions with you and Shri Sathyam were very fruitful. The following points were agreed upon in our meeting:

(i) Teaching skill of teachers in the NE Region need to be improved (with special emphasis on teaching of Science and Mathematics, as desired by the Hon'ble Prime Minister in his inaugural address at the 1st meeting of the Restructured NEC) and a beginning may be made at the Primary School level. This is also the considered view and recommendation of North Eastern Regional Educational Council (NEREC).

(ii) A large proportion of teachers in NER do not have even the basic teacher's training qualification. A special programme of skill upgradation-cum-motivational training would have to be organized for them. Even those who possess the basic qualification would need special training in teaching of Mathematics and Science to children at the primary level. Numbers being large, across NER by specially oriented trainers. The duration and contents of the course would have to be worked out. Then this initial training would have to be followed up by Refresher Courses at appropriate intervals. Here, we could take advantage of ODL and of ICT.

(iii) The broad consensus that emerged in the National Workshop on Distance Education in NER organised in the NEC Secretariat Conference Hall at Shillong (08-10 Mar) jointly by IGNOU, NEHU (Distance Education Deptt.) and NEC was also mentioned. It was felt that coverage of ODL and ICT would need to be vastly extended in NER on a crash basis. We had also felt that consultations should be held with IGNOU so that the best that the two premier organizations (NCERT and IGNOU) have to offer on this subject are synergized, coordinated and adapted to the special needs and conditions of NER.

(iv) It was in this context that we felt that the proposal formulated by Dr. D.S.Bhattacharjee, Principal, NERIE Shillong and another Report that I thought was from IGNOU, could be shared with each other before our meeting with VC IGNOU. On return to Shillong last evening, when I saw the document, it was Draft of a comprehensive Plan for Training of School Teachers of the North East Region drawn up by Dr. P.K. Bhattacharyya, Professor NIE, NCERT, New Delhi.

2. In view of the above, it may be appropriate if the two Plans from two wings of NCERT are merged into one and that is then shared with VC IGNOU for our proposed joint meeting preferably before you go out become unavailable by mid-June (on your return). Thereafter, we shall have a meeting with Education Secretaries/Commissioners of the 8 States around June-end and integrate our Teachers Training Programme with the Programmes of the States for in-service training of teachers. That would give us about two weeks before the top-level Sectoral Review Meeting of the HRD Sector in Imphal around mid-July to be taken by Shri Mani Shankar Aiyar, Hon'ble Chairman NEC and Union Minister of DoNER, Panchayati Raj and Youth Affairs & Sports.

I shall await your reply before writing to VC, IGNOU accordingly.

With regards,

Yours sincerely,

(P.P. Shrivastav)

Prof. Krishna Kumar,
Director
NCERT, Sri Aurobindo Marg
New Delhi-110016.

Copy with compliments to Shri S.Sathyam, EO NCERT and Member NEREC.

प्रमोद प्रकाश श्रीवास्तव
सदस्य, उत्तर पूर्वी परिषद
P.P.Shrivastav
Member NEC
Tel: 0364-2522642

उत्तर पूर्वी परिषद सचिवालय
शिलांग - 793 003
N E C Secretariat
Shillong - 793 003
Fax:0364-2522666

DO No. P/NEREC dated 4th June 07

Dear Dr. Krishna Kumar,

It was nice to have got the opportunity of meeting you the other day and discussing with you and Shri S.Sathyam certain important issues that are assuming urgency. In order to facilitate follow-up action, I am enumerating below some of the points discussed.

2. The Prime Minister's directions to NEC (Delhi - 12 Apr 05) were recalled along with the relevant elements of the Action Plan formulated by NEREC (NE Regional Educational Council) to implement his directions. (Relevant extracts are enclosed for ready reference). It was decided that time-bound Action Plans would be drawn up for specific programmes and that the State Governments would be consulted in a meeting with State Education Commissioners / Secretaries to be organised by NEC/NEREC in the first week of July.

3. It was agreed that NCERT, as the acknowledged leader at the national level in all matters relating to School education, would take the lead in Skill-upgradation-cum-Motivational training of Teachers with special emphasis on teaching of Mathematics and Science. It will also synergise the efforts of all others active in the field. Appropriate modules for such training would be worked out and details (e.g., durations/venues/numbers in a batch etc., for training of School teachers at different levels - Primary, Secondary and Higher Secondary, starting with training/orientation of potential trainers) would be worked out by NCERT.

4. Likewise IGNOU, as the acknowledged leader in ODL in the country, would take the lead in launching vastly expanded programmes for training and upgradation of vocational skills (relevant to the area) aimed chiefly at enabling the literate-unemployed youth to earn their livelihood in a respectable manner through *Value addition of local produce locally.* IGNOU will meaningfully synergise the programmes run by all other agencies, e.g., NEHU (Dept. of Distance Education), Sri Aurobindo Ashram Shillong, and such others.

5. The State Governments would be fully involved in all such programmes. A meeting of their Commissioners/Secretaries & Directors of Education would be convened by NEC/NEREC to coordinate and synergise the efforts made by the States in the aforementioned fields with those proposed to be launched by IGNOU/NCERT and others. VC IGNOU and Director NCERT were kind enough to agree to find time to participate in the meeting with State Governments. SCERTs and DIETs would be involved. Some other genuine, well-known, non-partisan, non-controversial NGOs, VOs with record of selfless service in the field in NER, would also be involved in this nation-building task.

6. It was also agreed that NEC/NEREC would use their good offices with the State Governments to ensure the teacher-trainees are nominated in sufficient numbers and that they

do attend the training courses organised for them by NCERT, IGNOU. This was considered necessary in view of past experience of inadequate nominations and absenteeism on part of nominees from NER. If need by, Hon'ble Chief Ministers (who are Members of NEC) would be addressed suggesting institutionalisation of follow-up action to ensure that (i) full advantage is derived from the aforementioned programmes aimed at capacity building among the youth for self-employment; (ii) progressive districts, progressive teachers, youth leaders and artisans etc., are identified by the State authorities so that their training could be taken up in the first phase; and (iii) necessary facilities are provided to optimize the multiplier effect by enabling these core personnel to carry forward the training programmes as Trainers.

7. Universities (and selected educational/vocational Institutions) would be involved in this exercise, since the ranks of educated-unemployed are mostly the former students of these institutions. Dropouts would be targeted for skill upgradation through ODL.

8. ODL will have to be given added momentum in NER to reach the unreached which includes the large segment of people who cannot afford time or money to join conventional institutions on whole time basis. It was agreed that the proposed IGNOU Centre in Shillong would be made functional with the utmost expedition and that full advantage would be taken of the commendable work done by the Distance Education Department of NEHU. Looking to the significance and volume of work involved, the idea of NE Regional Open University that emerged in the Shillong Workshop would also be pursued vigorously.

9. It was decided that roadmaps on these and other related topics would be drawn up mainly by NCERT/IGNOU for presentation before the Summit Review of HRD & Sports Sectors proposed to be held at Imphal on the 12th and 13th of July. Such Summit Review Meetings are chaired by the Hon'ble Minister of DoNER/PR/YAS who is also the Chairman of NEC and are attended by Members of NEC (including Governors & CMs), top officers of the concerned Central Ministries and Agencies and top concerned officers of the State Governments, besides those from DoNER & NEC.

10. I have held discussions on similar lines with Prof. V.N.Rajasekharan Pillai, VC IGNOU. Now we could have a joint meeting together to finalise our Road-maps for presentation at the Imphal Summit. A coordinated approach among all the stakeholders and pooling of resources would lead us all faster towards the common goal of us all.

Regards,

Yours sincerely,

(P.P. Shrivastav)

Dr. Krishna Kumar,
Director, NCERT,
Sri Aurobindo Marg,
New Delhi-110016.

Annex.6

PROJECT PROPOSAL TO NORTH EASTERN COUNCIL (NEC), SHILLONG

Submitted by NERIE-Shillong, 2006

Name of the Project : Training of elementary level teachers (class I-VIII) of North East Region on Science and Mathematics

1. INTRODUCTION: The North-East Region (NER) of our country has a lot of natural resources, proper use of which will lead to a sustainable developmentof the region. For proper use of natural resources, development of human resource is a prior condition. Development does not start with the resources, but it starts with educated human resources and socio-political stability. If we look into the development process in NER in the national context, we see that it is far lagging behind the main stream. The causes are multiple in nature and inter-related. Out of all problems, the most important problem of NER is basically about development of human resources. Honourable Prime Minister, Dr.M.M.Singh has rightly said[1], "... Development of Human Resources available in NER needs to be taken up on the highest priority". Education which can bring observable changes in the socio-economic, political and cultural life of the people is required for NER to bring sustainable development. The National Curriculum Framework-2005 has rightly mentioned about the basic concerns of education - to enable children to make sense of life and develop their potential, to define and pursue a purpose and recognize the right of others to do the same. It also says. "Equally, we need to reaffirm our commitment to the concept of equality, within the landscape of cultural and socio-economic diversity from which children enter into the portals of the school". If we can reflect these ideas of NCF-2005 in class room transaction, our out put will definitely be able to address the problems of NER.

But problem lies in the process of imparting it to children in our schools - particularly in NER. The percentage of trained teachers in NER is less than 50%. Particularly in primary education, trained teachers can change the whole scenario of education. For example, among all states of NER, Mizoram has highest rate of trained teachers (73%)[2] and interestingly the literacy rate of Mizoram is also highest among all the states of NER. This shows a linear relationship of trained teachers with literacy rate. Thus, to develop human resources in NER, the in service training to teachers needs to be taken up on the highest priority. Science and mathematics education needs special attention in NER. Large proportion of teachers in Primary schools who teach science and mathematics are untrained. They need to be trained in teaching of science and mathematics in a manner that their pupils develop a fascination for the mystery and logic of these subjects, rather than developing a scare of them for time to come.

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[1] Prime Minister's inaugural Address, 1st Meeting of Reconstituted North East Council, Parliament House Annexe, 12th April 2005.

[2] Basic Statistics of NER-2000, E & M Cell, Government of India, North East Council Secretariat, Shillong.

2. OBJECTIVES:

Keeping in mind the special need of science and mathematics education, this project is proposed, after discussion with NEC authority and experts, to train approximately 1.25 lac teachers of NER on mathematics and science. It is not only to develop their skills in these subjects but also to motivate them to become teachers in actual meaning or *guru.*

The main objectives of the proposed programme are

(i) To motivate teachers for creating a proper teaching-learning environment in schools.

(ii) To orient teachers for joyful teaching so that students get attraction for science and mathematics education.

(iii) To help teachers for making hands-on experiments related to science and mathematics (wherever necessary) to make teaching-learning process more effective.

(iv) To help teachers to relate outside experiences of student in class room transaction.

3. NUMBER OF TEACHERS TO BE TRAINED

Teachers from all the eight states of NER are proposed to be given training. Number of teachers from each state depends on every school. The state wise distribution is given below:

Sl.No.	State	No. of elementary schools	No. of teachers to be trained	No. of zones	No. of centers
1.	Arunachal Pradesh	1,663	3,326	2	9
2.	Assam	41,454	82,908	6	208
3.	Manipur	3,212	6,424	2	16
4.	Meghalaya	5,726	11,452	4	29
5.	Mizoram	1,974	3,948	2	10
6.	Nagaland	1,942	3,884	2	9
7.	Tripura	3,389	6,778	4	17
8.	Sikkim		6,280	3	15
			125,000		313

4. OTHER ORGANISATIONS TO BE INVOLVED

1. IGNOU, New Delhi and its regional branches; NCERT, New Delhi and RIEs;
2. Teacher's Associations of all the states
3. NGO's like Don Bosco, Ram Krishna Mission, ISKON, Science Societies of all the states etc.

5. ACTIVITIES

September – November 2006

1. Collection of syllabus and books from NE states (Identification of content areas) and discussion with concerned authority. Procurement of relevant material from NCERT, IGNOU, SCERT (Delhi), UNESCO, IIT (Delhi) and other similar agencies and discussions with experts in the field.
2. Development of Training material
3. Trainers conference with experts from NCERT, IGNOU and state representatives (from SCERT, DERT, State Boards, etc.)

December 2006 – December 2008

4. Trainers conference with experts from NCERT, IGNOU and state representatives (from SCERT, DERT, State Boards, etc.)
5. Organisation of actual training programme - –Feedback (responses)
6. Workshop for improvement/modification of training material
7. Finalisation of training material
8. Conduct of training programmes

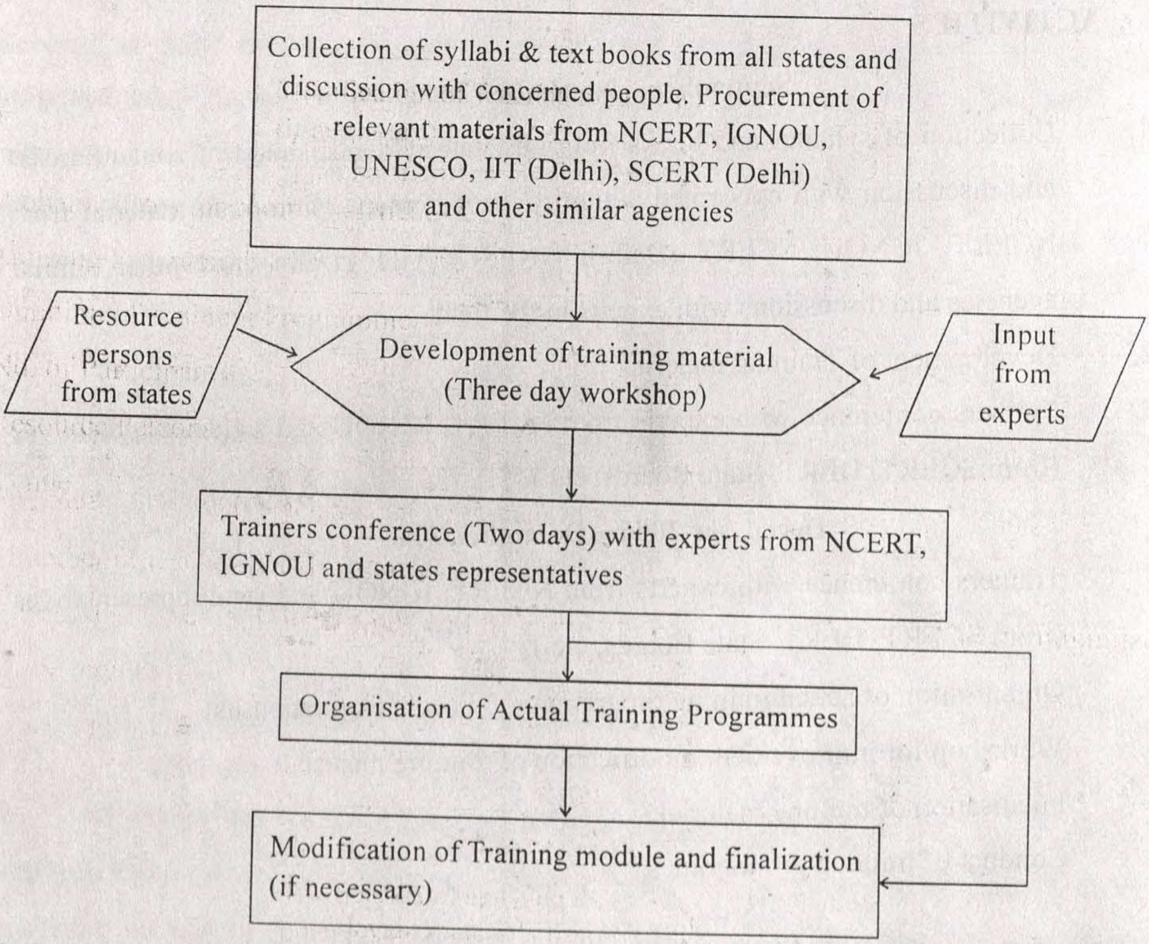
6. PLANNING OF TRAINING PROGRAMME

6.1 One training programme: It is proposed to carry out 4 sessions of 4 groups in parallel at one center. There will be 100 participants in one group and thus will be 400 participants in each center. This structure will be referred as one programme henceforth.

Zones : A state will be divided into some zones and Number of centers in such a zone will be decided on the basis of number of teachers of that place and after consultation with local NGOs/SCERT/DERT/DIET/other institution which will be the local organizers of the programme. It is proposed to carry out parallel training programmes in one zone. If, for example, 10 centers are chosen in a zone and 10 training programmes are organized in parallel, then 4000 teachers can be trained in 10 days. Thus, in one month 4000 × 3 = 12000 number of teachers can be trained.

If possible training programmes will be carried in parallel at two/three zones to minimize the time required.

Programme Flowchart:


Collection of syllabi & text books from all states and discussion with concerned people. Procurement of relevant materials from NCERT, IGNOU, UNESCO, IIT (Delhi), SCERT (Delhi) and other similar agencies
Resource persons from states
Development of training material (Three day workshop)
Input from experts
Trainers conference (Two days) with experts from NCERT, IGNOU and states representatives
Organisation of Actual Training Programmes
Modification of Training module and finalization (if necessary)

Probable dates for commencement of Training Programme : 1st week of December 2006

Duration of Training Programme : 10 days

No. of Participants : 400

Resource Persons :

Venue : All States

6.2 Programmes Schedule

Day I

i) Teacher as a guiding light

ii) Science & Mathematics in everyday life

iii) Use of educational technology and ICT in school education

iv) Need to sensitize school children in environmental education

Day II

i) Aims of Education

ii) What is wrong with Today's Education and ways and means of addressing these.

iii) Child behaviour and positive thinking: Can a teacher learn from his/her student?

iv) Classroom management skill and professional ethics

Day III

Discussion on science / mathematics book for Class I & II

Day IV

Discussion on science / mathematics book for Class III & IV

Day V

Discussion on science / mathematics book for Class V

Day VI

Discussion on science / mathematics book for Class VI

Day VII

Discussion on science / mathematics book for Class VII

Day VIII

Discussion on science / mathematics book for Class VIII

Day IX

i) Utilize experiences from daily life and immediate environment

ii) Comparative study of National Curriculum with that of every state.

iii) Need to develop communication skill of children

iv) Exploring child's creative potential

Day X

Connection of science and mathematics with other subjects e.g. language, music, sports, technology etc.

Feedback from participants
Valedictory Function
TA/DA disbursement for participants

7. DETAILED BUDGET BREAKUP

Activity 1. Collection of syllabus and books from NE states (Identification of content areas) and discussion with concerned authority. Procurement of relevant material from NCERT, IGNOU, SCERT (Delhi), UNESCO, IIT (Delhi) and other similar agencies and discussions with experts in the field.

Sl.No.	Item	Estimated expenditure in Rs.
1.	Syllabus and books @ 3000	24,000
	Books and relevant materials (science kits, CDs etc.)	50,000
2.	TA and DA for two persons @ 20000 to all 8 states	1,60,000
	TA and DA for two persons @ 30000 from Delhi	60,000
3.	Miscellaneous	20,000
	Total	Rs.3,14,000

Activity 2. Development of Training material (three days workshop)

Sl.No.	Item	Estimated expenditure in Rs.
1.	TA & DA to 10 RPS (Regional) and honorarium @ Rs. 500 × 3 × 15 (10 + 5 NERIE)	50,000
2.	Breakfast @ Rs 25 × 60 × 3	4,500
3.	Lunch @ Rs. 60 × 20 × 3	3,600
4.	Tea @ Rs. 10 × 60 × 3	1,800
5.	Computer typing, printing	20,000
6.	Miscellaneous	10,000
	TOTAL	**Rs. 89,900**

Activity 3. Trainers conference (two days) with experts from NCERT, IGNOU and state representatives (from SCERT, DERT, State Boards, etc.)

Venue : Respective State

Sl.No.	Item	Estimated expenditure in Rs.
1.	TA & DA & honorarium to experts from NERIE/NCERT, IGNOU etc.	1,50,000
2.	TA and DA for RPs (100) from respective state/zone and NERIE faculties	1,00,000
3.	Breakfast @ Rs 25 × 80 × 2	4,000
4.	Lunch @ Rs 60 × 80 × 2	9,600
5.	Tea and snacks @ 10 × 80 × 2	1,600
6.	Training materials to RPS @ 500 × 50	25,000
7.	Miscellaneous (hiring of generator, OHP, LCDP, PAs, rooms and halls at the venue, chart paper, marker pen, sketch pen, drinking water, banner, photography, fuel, local conveyance, papers, Xerox of training material, CDs, floppies, computer typing, laboratory equipments etc.)	30,000
	TOTAL	**Rs. 3,20,000**

Activity 4. Organisation of actual programme

Detail Budget breakup for one Training Programme for 400 participants

Sl.No.	Item	Estimated expenditure in Rs.
1.	DA & TA for RP's (45)	1,00,000
2.	Honorarium for 160 sessions @ 500	80,000
3.	TA (Rs.500) & DA @ 100 to Participants for 10 days	6,00,000
4.	Lunch @ Rs 50 × 450 × 10	4,50,000
5.	Breakfast @ 20 × 450 × 10	90,000
6.	Tea and snacks @ 15 × 450 × 10	67,500
7.	Training material to participants @ Rs 200 × 400	80,000
8.	Stationary for participants (folder, pen, pad) @ Rs.50×450	22,500
9.	TA and DA to 5 NERIE faculties	22,000
10.	Expenditure on local organizer	10,000
11.	Miscellaneous (hiring of generator, OHP, LCDP, PAs, rooms and halls at the venue, chart paper, marker pen, sketch pen, drinking water, banner, photography, fuel, local conveyance, papers, Xerox, CDs, floppies, computer typing, laboratory equipments, postal charge etc.	30,000
	TOTAL	**15,52,000**
	TOTAL FOR 313 PROGRAMMES	**48,57,76,000**

Activity 5. Workshop for improvement/modification of training material

Activity 6. Finalisation of training material

(Workshop for three days)

Sl. No.	Item	Estimated expenditure in Rs.
1.	TA & DA to 10 RPS (Regional)	25,000
2.	Breakfast @ Rs. 25 × 20 × 3	1,500
3.	Lunch @ Rs. 60 × 20 × 3	3,600
4.	Tea @ Rs. 10 × 20 × 3	600
5.	Computer typing & printing	20,000
6.	Miscellaneous	10,000
	TOTAL	***Rs. 60,700**

Excluding printing charges

Activity 7. OTHER EXPENDITURE

Sl. No.	Item	Estimated expenditure in Rs.
1.	Six Laptops @ 70,000	4,20,000
2.	Two trunks @ 3000	6,000
3.	Two briefcases @ 3000	6,000
4.	One mobile set	10,000
5.	One printer	15,000
6.	Office stationary and other expenditure for two years (files, pens, pencils, paper, phone bill etc.)	1,50,000
7.	One digital camera for preparation of training manual	15,000
8.	Zonal offices expenditure	1,50,000
9.	TA & DA for co-ordinator & members for visiting different zones and centers to organize programme	3,00,000
	TOTAL	**Rs. 10,72,000**

9. SUMMARY OF EXPENDITURE

Activity Number	Activity	Estimated Budget	Time
1.	Collection of syllabus and books from NE states (Identification of content areas) and discussion with concerned authority. Procurement of relevant material from NCERT, IGNOU, SCERT (Delhi), UNESCO, iit (Delhi) and other similar agencies and discussions with experts in the field.	3,14,000	September - October 2006
2.	Development of Training material (Three days workshop)	89,900	October - November' 06
3.	Trainer's conference (two days) with experts from NCERT, IGNOU and state representatives (from SCERT, DERT, State Boards, etc.)	32,02,000	November 06 and onwards
4.	Organisation of actual training programme	48,57,76,000	December' 06 - December' 08
5 & 6	5 Workshop for improvement/modification of training material 6 Finalisation of training material (Workshop for three days)	60,700	March - April 07
7.	OTHER EXPENDITURE	10,72,000	
	TOTAL	**49,05,14,600**	
	Expenditure per teacher	**3,925**	

**** The training mode can be e-learning mode wherever possible.**

From:
Prof. P.K. Bhattacharyya,
NIE, NCERT,
New Delhi-110016.

Fax to:
Prof.D.S.Bhattacharjee
Principal-NERIE,Shillong
0364-2522744

Minutes of the Meeting with Director - NESAC (North Eastern Space Application Centre), Barapani, Shillong on 27th June, 2007.

The meeting was held in the office of the Director NESAC. The following officers were present:

Dr. K.C. Bhattacharyya Director, NESAC, Govt. of India, Deptt. of Space, Umlam, Shillong, 793103. Tel. 0364 - 2570141, Fax. 0364 - 2570139.

Prof. D.S. Bhattacharjee, Principal, NERIE - Shillong

Prof. M.K. Satpathy, NERIE Shillong.

Dr. Anil Borah, Reader, NERIE - Shillong

Professor P.K. Bhattacharyya, NCERT, New Delhi-110016.

The Report "Training of School Teachers of the NE Region in Satellite and Face-to-Face modes - A Plan" (authored by Prof. P.K.Bhattacharyya) was at the focal point of discussion, particularly in the matter of networking of institutions with the help of EDUSAT.

2. As per CIET (NCERT)'s statement, 8 sites in the NE were fully 'completed' (Assam - 4, Manipur - 2, NERIE - 1, Mizoram - 1) while installations at 7 sites (Assam - 3, Meghalaya - 1, Nagaland - 1, Sikkim - 1, Tripura - 1) are incomplete due to various problems like road permit, information gap, unprepared site, etc. CIET utilised EDUSAT for 36 days (4 hours a day) during 6 July - 20 Aug. 2006 in teleconferencing with school teachers at about 28 centres in NCERT - EDUSAT (national beam) network. A similar programme will be carried out this year (2007) also during 9 July to 21 August 2007. Considering that nearly 50% of the life of the Satellite is already over, no significant impact has been mode in teacher preparation through EDUSAT so far NE region is concerned.

3. So a request was made to the Director - NESAC whether ISRO could establish nearly 250 centres dotted over the NE region, so that curriculum could be transacted to those 250

centres with one SIT at the NERIE (which will uplink as a hub). Director - NESAC said that it is possible in the network under North Eastern beam. In fact 231 centres, as detailed below, have already been commissioned. This NE beam is grossly underutilised. If NERIE has to transact curriculum from its campus in Shillong, one SIT for the NE beam has to be commissioned there. NERIE has to consult the eight states about time-slotting in-service teacher training programme. The details of 231 sites:

- **Arunachal Pradesh**

DIETs	6 Nos.
Higher Secondary Schools	43
Polytechnic	1
Total	**50**

- **Meghalaya**

DIETs	7 Nos.
College of Education	4
H.S. Schools	19
Sec. Schools	17
Polytechnics	3
Total	**50**

- **Mizoram**

Telescoping DIETs	8 Nos.
College of Teacher Education	1
BRC (Block Resource Centre)	22
Total	**31**

- **Nagaland**

Govt. H.S. Schools	12 Nos.
Govt. Colleges with H.S. Schools	8
Govt. Polytechnic	3
DIET	7
College of Education	1
Edu. Block Resource Centres (EBRC)	19
Total	**50**

- **Tripura**

DIET	4 Nos.
Inst, of advanced studies in Education	1
BRC (located in HS Schools for Trg. of Teachers at Block level)	45
Total	**50**

Under this scheme (NE beam) centres at Assam, Manipur and Sikkim are yet to be established.

4. The merit of beaming teacher training institutes only in this phase was also discussed. It was felt that as there is no slot in the school time table for viewing TV, it will be wasteful to transmit programmes in the classroom without proper planning. In the eighties and nineties CIET (NCERT) equipped schools with colour TVs and RCCPs. The feedback from various states showed gross underutilisation (or no utilisation at all) of TVs and RCCPs in schools.

5. The possibility of utilisation of radio in in-service Teachers' Trg. was discussed. It was reported that Teacher Training modules in Garo, Khasi and other languages are available with IGNOU. It was felt that radio lesson (in teachers' trg.) has huge potential considering its penetration. FM Radio delivering IGNOU lessons is already a success.

6. Director - NESAC informed that the NESAC Campus will soon be equipped for supporting educational activities of institutes of the NE region which will be using satellite technology for ODL and e-learning.

The meeting ended with a vote of thanks to the Director - NESAC.

Annex.8

7th All India School Education Survey

(Reference Date : 30th September, 2002)

Secondary and Higher Secondary Education

1. Number of Schools having Secondary/Higher Secondary Stages

Sl.No.	State	Rural		Urban		Total	
		Sec	HS	Sec	HS	Sec	HS
1	2	3	4	5	6	7	8
1.	Arunachal Pradesh	156	47	48	25	204	72
2.	Assam	3765	563	658	202	4423	765
3.	Manipur	428	62	203	50	631	112
4.	Meghalaya	392	37	202	46	594	83
5.	Mizoram	213	6	170	39	383	45
6.	Nagaland	171	9	112	18	283	27
7.	Sikkim	120	39	11	4	131	43
8.	Tripura	523	161	120	79	643	240

Sec stands for 'secondary'
HS stands for : Higher Secondary

2. Enrolment

(a) Secondary Stage

(i) Overall

Sl.No.	State/U.T.	Enrolment in Lakh		Girls%		Gross Enrolment Ratio		
		Rural	Total	Rural	Total	Boys	Girls	*Total*
1.	Arunachal Pradesh	0.14	0.25	40.64	42.13	51.97	39.60	45.93
2.	Assam	6.64	8.25	47.84	48.18	40.74	41.20	40.96
3.	Manipur	0.39	0.63	48.73	48.88	52.84	52.70	52.77
4.	Meghalaya	0.40	0.73	50.78	51.71	34.69	38.12	36.37
5.	Mizoram	0.14	0.38	49.04	50.20	49.59	52.30	50.92
6.	Nagaland	0.14	0.27	47.11	48.04	21.80	22.22	22.00
7.	Sikkim	0.10	0.12	48.90	49.57	38.77	39.83	39.29
8.	Tripura	0.60	0.82	45.38	46.55	52.68	48.85	50.83
	INDIA	126.07	218.89	38.96	41.51	51.28	41.50	46.71

(ii) Enrolment at Scheduled Castes, Scheduled Tribes and Educationally Backward Minority Community (Muslims)

Sl. No	States/U.T.	Scheduled Castes			Scheduled Tribes			Educationally backward Minority Community (Muslims)		
		Enrolment in lakh	% to Total	Girls (%)	Enrolment in lakh	% to Total	Girls (%)	Enrolment in lakh	% to Total	Girls (%)
1.	Arunachal Pradesh	0.001	0.56	45.71	0.17	69.26	41.38	0.001	0.39	38.78
2.	Assam	0.890	10.82	48.49	1.37	16.61	47.85	1.46	17.71	46.5
3.	Manipur	0.020	4.42	47.21	0.18	28.43	46.48	0.04	6.40	47.13
4.	Meghalaya	0.280	2.91	54.77	0.62	84.78	52.76	0.02	2.19	41.50
5.	Mizoram	0.003	0.81	41.75	0.38	99.13	50.28	0.0002	0.06	34.78
6.	Nagaland	0.005	1.84	44.60	0.26	97.26	48.12	0.002	0.73	44.95
7.	Sikkim	0.005	4.76	46.90	0.03	24.18	53.41	0.002	1.64	47.62
8.	Tripura	0.160	18.88	46.44	0.23	28.23	43.48	0.06	6.80	46.09
	INDIA	33.70	15.39	39.49	12.32	5.63	38.61	25.30	11.56	42.94

(b) Higher Secondary Stage

(i) Overall

Sl.No.	State/U.T.	Enrolment in Lakh		Girls%		Gross Enrolment Ratio		
		Rural	Total	Rural	Total	Boys	Girls	*Total*
1.	Arunachal Pradesh	0.05	0.13	37.92	38.52	31.41	21.20	26.49
2.	Assam	1.08	1.94	40.80	41.81	19.41	15.71	17.67
3.	Manipur	0.21	0.38	47.12	46.91	33.60	30.40	32.02
4.	Meghalaya	0.06	0.30	43.66	48.24	27.67	26.90	27.29
5.	Mizoram	0.005	0.11	42.74	49.34	27.20	27.27	27.23
6.	Nagaland	0.02	0.098	38.63	43.68	8.51	7.37	7.97
7.	Sikkim	0.06	0.06	46.99	49.05	22.76	22.89	22.82
8.	Tripura	0.16	0.30	38.32	41.99	23.06	17.93	20.59
	INDIA	45.30	114.38	38.31	41.24	28.97	24.15	26.77

(ii) Enrolment at Scheduled Castes, Scheduled Tribes and Educationally Backward Minority Community (Muslims)

Sl. No	States/U.T.	Scheduled Castes			Scheduled Tribes			Educationally backward Minority Community (Muslims)		
		Enrolment in lakh	% to Total	Girls (%)	Enrolment in lakh	% to Total	Girls (%)	Enrolment in lakh	% to Total	Girls (%)
1.	Arunachal Pradesh	0.001	0.62	48.78	0.08	63.44	37.99	0.0004	0.28	37.84
2.	Assam	0.18	9.17	40.04	0.24	12.64	39.28	0.27	14.03	37.50
3.	Manipur	0.02	4.38	43.17	0.09	23.87	45.51	0.02	5.18	44.02
4.	Meghalaya	0.01	3.03	44.81	0.24	79.06	49.55	0.005	1.73	32.11
5.	Mizoram	0.002	1.4	50.31	0.11	98.21	49.34	0.0004	0.39	45.45
6.	Nagaland	0.004	3.65	17.37	0.09	95.85	44.89	0.0005	0.22	4.08
7.	Sikkim	0.003	4.45	49.29	0.01	22.55	54.80	0.0008	1.26	40.51
8.	Tripura	0.06	18.9	42.56	0.05	16.50	32.43	0.02	6.07	36.78
	INDIA	14.59	12.76	38.35	5.22	4.56	35.57	11.64	10.18	41.21

3. No. of Teachers in Position : School Categorywise

Sl.No.	State/U.T.	Category of School				
		Primary	Upper Primary	Secondary	Higher Secondary	Total
1.	Arunachal Pradesh	3206	2815	1899	1967	9887
2.	Assam	85389	57629	44840	21907	209765
3.	Manipur	8238	8960	9160	3204	29562
4.	Meghalaya	14326	5519	5186	2201	27232
5.	Mizoram	3168	4328	1775	7.28	14458
6.	Nagaland	4110	2811	2606	473	17560
7.	Sikkim	3346	2173	2314	2167	8104
8.	Tripura	2655	1707	2678	2960	33572
					Total	**3,50,140**

Note: School category is determined on the basis of highest class in the school

4. No. of Untrained Teachers

(i) Secondary Stage

Sl.No.	State	Total Teachers	Untrained Teachers	% Untrained
1.	Arunachal Pradesh	1269	517	40.74
2.	Assam	51194	35816	69.96
3.	Manipur	5018	2911	58.01
4.	Meghalaya	4845	2819	58.18
5.	Mizoram	2640	1017	38.52
6.	Nagaland	2046	1494	73.02
7.	Sikkim	1086	616	56.72
8.	Tripura	5773	3663	63.45
		Total	**48853**	

(ii) Higher Secondary Stage

Sl.No.	State	Total Teachers	Untrained Teachers	% Untrained
1.	Arunachal Pradesh	586	190	32.42
2.	Assam	8540	5015	58.72
3.	Manipur	1436	835	58.15
4.	Meghalaya	609	308	50.57
5.	Mizoram	528	332	62.88
6.	Nagaland	224	165	73.66
7.	Sikkim	428	232	54.21
8.	Tripura	3130	1971	62.97
		Total	**9048**	

No. of teachers Subjectwise has not been collected in 7th All India School Education Survey.

5. Out-of-School Children

Out-of-school children in secondary and higher secondary stages are computed by multiplying [1-(GER/100)] and estimated child population in the respective age groups

Sl.No.	State	Secondary Stage	%	Higher Secondary Stage	%
1.	Arunachal Pradesh	29229	54.07	36652	73.51
2.	Assam	721075	59.04	902854	82.33
3.	Manipur	56267	47.23	80467	87.98
4.	Meghalaya	77843	63.63	79740	72.71
5.	Mizoram	21132	49.08	30306	72.77
6.	Nagaland	96104	78	112856	92.03
7.	Sikkim	17793	60.71	21262	77.10
8.	Tripura	79610	49.17	116380	79.41

6. Drop Out Rate: Grade-wise (Manipur not available) 2005-06

	GRADES							
State Name	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**I-V**
Arunachal Pradesh	24.2	12.5	12	10.4	14.4	11	9.3	15.9
Assam	13.6	9.9	11	12.2	8.5	8.2		11.2
Meghalaya	33.3	15.9	18.2	18.9	15.4	14		22.5
Mizoram	22.4	10.9	7.6					3.2
Nagaland	4.3	6	9.9	21	4.4	1.4	0.7	8.9
Sikkim	6	0.7	5	10.1	7.7	14.1	11.9	5.7
Tripura	6.5		4.3	4.7	6.7	7.5	6.3	4.0

Annex.9

Report of

Training of Elementary Teachers (Science) of North Eastern States

4 – 8 December, 2006 NERIE - Shillong

Dr. P K Bhattacharya
Professor – NIE Workshop

CONTENTS

A. Introduction
B. Programme Schedule
C. About participant teachers
D. Experiments/ Activities performed by the participating teachers
E. Problem Solving Questions
F. Evaluation
G. Recoomendations
H. List of Participating Teachers

NATIONAL COUNCIL OF EDUCATIONAL RESEARCH & TRAINING
NEW DELHI - 110016

Training of Elementary Teachers (Science) of North Eastern States

4 – 8 December, 2006 NERIE - Shillong

A. Introduction

The council had earlier asked me to study the status of Teacher Education in the North East region. I visited NERIE and SCERTs of two NE stats during 24.8.06 to 02.09.2006. My interactions with SCERTs of two states and faculty of NERIE – Shilling along with some data which could be collected on the spot have been submitted in the form of a Report titled Teacher Education in Distance Mode for the North Eastern Region on 13.09.2006.

Plan and budget prepared by NERIE for training 1.25 lakh untrained elementary teachers of NE region was submitted to the NEC (North East Council) which is supposed to release fund. But NERIE is yet to receive any communication on that, as of now.

The traning programme of above title was approved by the PAC (Programme Advisory Committee) of NCERT and the author of this report initiated the programme as the programme coordinator. NERIE had to make enormous effort in getting names of teachers from respective SCERTs/School Boards. **Being the very first training programme of this type** considerable time was spent on breaking the ice. Though originally planned for 30 teachers, we could get 18 teachers. The programme was conducted with the support of the following faculty of NERIE – Shillong:

- Principal NERIE – Honorary Programme Director
- Prof. M.K. Satpathy
- Dr. Anil Borah
- Dr. Roshni Sharma
- Dr. Ashwin Garg
- Prof. P.K. Bhattacharyya - Programme Co-ordinator

Sustained efforts of Dr. Anil Borah , ReaderNERIE could bring the teachers to NERIE for training. It is he who brought the integrated Science kit from the NCERT Hq to NERIE , Shillong. His team purchased chemicals and other consumables for conducting the training rogramme as per the kit manual and list sent from Delhi.

This teacher training programme has been very significant as:

(a) NERIE being in the formative stage has to equip itself with training materials, like science equipment, printed, projected and non-projected materials, educational software, etc. This was the very first step.

(b) The background and entry profile of teachers, ground realities in schools, willingness, attitude of teachers have to be known before embarking on a massive teacher training programme.

(c) The science faculty in NERIE who are very new to the NCERT system have to be told about method and practice in conducting such teacher training (student – centred, activity oriented, constructivist approach, problem solving, critical thinking, interactivity, collaborative learning, use of educational technology, etc.). **This training programme thus helped NERIE,– Shillong in capacity building among others.**

B. Programme Schedule

The Schedule and time table were carefully designed so as to make the programme learner – centered, activity oriented and interactive. The schedule is given at pages 126-127. Some science activities are given at pages 128-131. Additionally Prof. M.M.Singh of NEHU (local Resource Person) conducted one interactive session.

C. About participant teachers

The qualification of teachers are given below.

They have teaching experience ranging from 2 years to 13 years. Most teachers have around 10 years of teaching experience. In the very first session they were divided in six groups, each group having near equal distribution of male and female as well as backgrounds of Physics, Chemistry and Biology.

Gr I — (1) Shri C. Wanniang – Pu. Sc.
(2) Shri P. Lyngdoh - DCE
(3) Smt. A. Dey – BSC, PCB

Gr II — (1) Shri M. Nongsiej – BSC BC
(2) Shri H. Kharkamni – BSC BC
(3) Smt. M. Jhongri PUSC

Gr III— (1) Smt. M. Warjri – BSC, BC, Bed
(2) Smt. R. Karmakar – BSC PCM
(3) Smt. M. Nongbri - DCE

Gr IV — (1) Smt. B. Lyndem – BCC, BC
(2) Shri D. Burua – PUSC BA Math
(3) Smt. D. Kynta – BSC BIO

Gr V — (1) Smt. W. Marwein – BSC Bed
(2) Shri D.E. Turmia – BSC, PCM
(3) Shri S.K. Lyngkhoi – BSC M. Statistics

Gr VI — (1) Smt. D. Lyngdoh - BA
(2) Shri C.S. Singh – BSC M. Statistics
(3) Smt. D. Ramsing PUSC

Programme Schedule

Training of Elementary Teachers (Science) of NE States

NERIE - Shillong : 4 - 8 December 2006

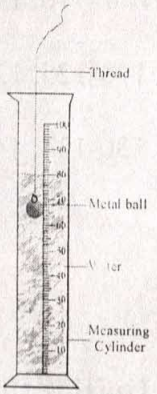
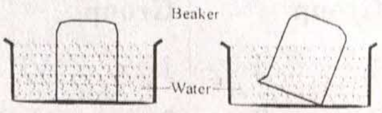
Dates	09.00 to 10.00 hrs.	Tea Break	10.45 to 12.15 hrs.	12.15 to 13.30 Hrs.	Lunch Break	14.00 - 15.30 Hrs.	Tea Break	15.45 - 17.30 Hrs.
4 Dec.	Registration Welcome		Formation of Groups, Prog. briefs Sc. Curriculum	Activity Schedule 'A'		Preparation of lesson plan, pedagogical issues		Group Reporting/Demo-lecturers (Physics related)
5 Dec.	Demo Lecture-2 (Chem. related)		Activity 'B'	Activity 'A', 'B' Contd.		Activity 'C'		Problem Solving/ Critical Thinking/ Group reporting
6 Dec.	Activity 'D'		Activity 'C', 'D'. Contd.	Demo. lecture-3 (Bio related)		Framing Prob. Solving Qs.1		Group Reporting / Teaching Practice
7 Dec.	Activity 'E'		Lecture-4 (Instructional Technology)	Lecture-5 Edu. Tech in classroom		Exercises on Edu. Tech/ICT in Classroom/		Group Reporting/ Teaching Practice
8 Dec.	More ET : CAL, virtual Lab, e-learing		at least 10 prob. solving questions from each group	interactive MM courseware		Workshop Report, evaluation, veledictory		

Schedule of Activities

	Manual Page Nos.
I	35 (Activity 1), 37 (Activity 4-5), 39-41 (Activity 7 - 9), 46 (Activity 17 - 18), 47 (Activity 19-20), 50 (Activity 35 - 37), 51 (Activity 38 - 40), 53-58 (Activity 25 - 48).
II	61 - 62, 64, 66, 68, 70, 73-77.
III	80-84, 86-89, 91, 92, 94, 97-102.
IV	103-108, 110, 113, 114, 117-119
V	122, 123-125, 126, 127
VI	128, 130-134, 140, 141-143

Allotment of Activities to each Group

'A'	'B'	'C'	'D'	'E'
Group	Group	Group	Group	Group
1 ... I	1 ... VI	1. ... II	1. ... III	1. ... IV
2. ... II	2. ... V	2. ... I	2. ... IV	2. ... III
3. ... III	3. ... IV	3. ... V	3. ... VI	3. ... I
4. ... IV	4. ... III	4. ... VI	4. ... V	4. ... II
5. ... V	5. ... II	5. ... III	5. ... I	5. ... VI
6. ... VI	6. ... I	6. ... IV	6. ... II	6. ... V

Activity 1	Requirement
To show all forms of matter (solid, liquid and gas) ccupy space. Procedure 1. Solids occupy space - Take a metal ball with hook and measuring cylinder. Pour water in measuring cylinder. Suspend the metal ball with the help of a thread in the water in the cylinder. Observe rise in the water level. Take the ball out and again observe the dip in the level. 2. Liquids occupy space – pour a small quantity of water in the measuring cylinder, decimetre cube and beaker and observe water level in them. 3. Gases occupy space - (i) Take the decimetre cube or a trough. Fill it with water and invert an empty beaker over it. Water doesn't enter the beaker. Tilt the beaker so that water goes inside it and you can see the air bubbles coming out. (ii) Inflate a balloon. What is inside the inflated balloon? It is the air occupying space in side it.	Beaker, balloons, pebbles of different sizes, sand (20 g), measuring cylinder, ball with hook, decimetre cube vessel,  

Activity 9

To demonstrate different methods of separating of mixtures

Procedure

1.Magnetic Separation :
Separate mixture of iron and sand with the help of a bar magnet.

2. Sieving : Sieve chalk powder and pebble mixture through a sieve.

3. Sedimentation & Decantation

A. Solid in liquid
Take 2 beakers. In one beaker, take a mixture of water and sand. Keep it for few minutes and let sand settle down at the bottom.
Now decant clear layer of water with glass rod into other beaker.

B. Liquid in liquid
Take a beaker and take mixture of oil and water in it. Now take another small beaker and one glass rod. Decant water and collect it in beaker.

Improvised separating funnel with glass bead in the plastic pipe and a attached jet can be used to separate oil from the mixture of oil and water.

4. Loading
Take a beaker. Half fill it with muddy water. Now tie a piece of alum with thread and suspend it in muddy water. Keep it for 15 minutes.

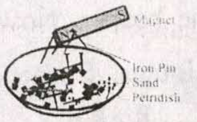
5. Centrifugation: Solids can be separated from solution with centrifugal machine.

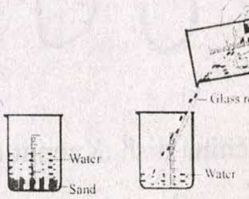
6. Filtration
i). Take 2 beakers .ii), Take mixture of sand and water in it. iii) Take a filter paper and fold it four times and fit it in the funnel. iv). Now pour this mixture through rod into funnel. v) We get clear water in beaker and sand is left behind on the filter paper.

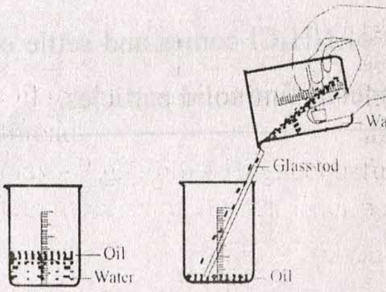
Requirement

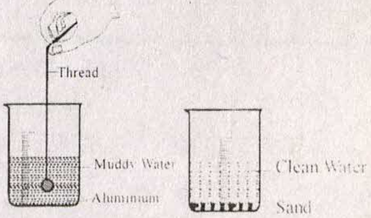
Petri dish, iron nails (1 g), sand (2g), bar magnet, sieve , chalk powder, small pebbles, beakers - (100 mL), glass rod,

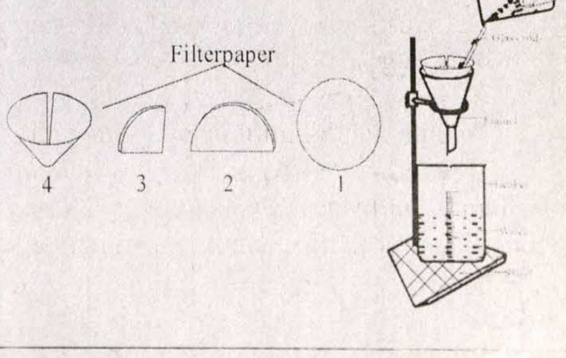
Oil (5 mL), separating funnel, oil, thread,
clay - 2 g, alum - 10 g, centrifuge, small test tube, clay, funnel, filter paper, stand.

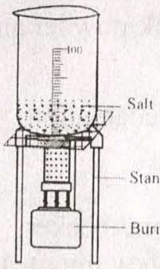
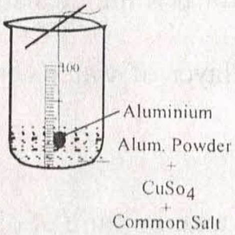


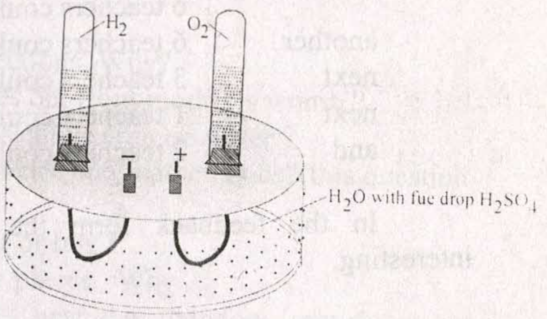








7.Evaporation Take a mixture of water and salt in a beaker. Keep it on tripod stand. Now heat this mixture with burner. Water evaporates and salt is left behind in the beaker. 8. Crystallization Take a beaker. Take small quantities of alum powder + $CuSO_4$ + NaCl in the beaker. Now dissolve it in water. Heat this mix for 5 minutes. Suspend a piece of alum with thread in mixture. Keep it for 2 days. 9. Sublimation Take NH_4Cl in a china dish .Keep it on tripod stand . Keep the funnel on china dish. Wrap wet blotting paper on the outer of the funnel. Heat this substance. Fumes of NH_4Cl comes and settle on the inner surface of the funnel as fine solid particles.	Beaker (100 mL), glass rod, wire gauze, china dish, burner, tripod stand, NaCl, alum, copper sulphate, china dish, funnel, cotton plug ,NH_4Cl or comphor - (5g), filter paper   100 Aluminium Alum. Powder + CuSo4 + Common Salt

Activity 20 To study electrolysis of water Procedure i) Fill the apparatus with water and add one drop of H_2SO_4 or NaOH ii) Invert the two test tubes over the rubber stoppers iii) Invert the water filled container so that the two test tubes are filled with water. (iv) Connect the two electrodes to the DC terminals of control panel of the generator Precautions i) Dil. HCl should not be used for electrolysis. ii) If battery is used, a battery 6V with more than 1A should be used iii) Electrodes and test tubes should be cleaned properly and lower position (outside position) of electrode should be coated with nail polish (so that only exposed portions of electrodes are inside the tube.) (iv) Each test tube should be completely filled with water. Lower open end of each should be dipped in water in the trough.	Electrolysis apparatus, 6V DC from generator. connecting wires , a few drops of H_2SO_4 or NaOH. 

D. Experiments/activities performed by the participant teachers:

- Written instructions with sketches in respect of 244 experiments/activities were given to them. Out of these some could perform 18 while others could 32 activities, as follows:

	6 teachers could perform and explain 18 experiments / activities,
another	6 teachers could perform and explain 22 experiments/ activities,
next	3 teachers could perform and explain 23 experiments / activities,
next	1 teachers could perform and explain 28 experiments / activities,
and	2 teachers could perform and explain 32 experiments / activities,

In the feedback form the teachers rated some experiments/activities as very interesting.

- The teachers were also shown on the computer screen **interactive computer assisted learning package in multimedia**, during which they in rotation responded to multiple choice questions, test questions, etc. Examination of a drop of pond water on a Microscope (500X) in virtual environment was also shown. The chapter on 'Balance in Nature' with simulation aroused everybody's interest in such interactive learning.

E. Problem Solving Questions

The teachers had not heard of 'Problem Solving Question' or 'Critical Thinking Question' prior to attending the training. After a demo lecture in which those were explained with examples, they were enthused and engaged themselves coining such questions. These are detailed below:

1. Is light matter ?
2. Rivers are always flowing downwards, not upwards, Why?
3. Do all matters have weight?
4. Why is there so much sand near the sea and also so much sand on the desert, yet there is no water near the desert?
5. Why is the rainbow always shaped like a bow?
6. Why most of the birds always sing in the morning? What makes them sing?
7. Is there any tree which has no branches?
8. Can we say that there are 8 (eight) Planets in the solar system ?
9. If we continue to add fertilizers to our agricultural land , what will happen to the soil in the next 10 years to come?
10. Why is the flying bird's shadow not seen on the ground when it is flying higher?
11. How do the skaters run very fast on the smooth surface of Ice?
12. Do the methods of Natural Selection preserve and conserve even those animals which are becoming extinct?
13. Why do some people sleep with their eyes half closed?
14. Weight of a person is less on the surface of the moon than that on the earth. Is this having any effect on the person?
15. There are many endangered species by now. Will man also become one?

16. Earth exerts pull only on those bodies which have some mass. Why?
17. What would happen if machines such as Robot take control over the human?
18. Can we can prepare our own food like plants?
19. Aeroplane never casts any shadow on earth while flying high. Why?
20. Are you applying any force while swallowing food?
21. A piece of cloth, if kept in the sun for a few days ,starts fading its colour. why?
22. While using a hand pump , faster the pumping more is the water received. Why?
23. Why are leaves so important not only for plants but also for us?
24. How does a single aeroplane crashing at the the mid-section of the World Trade Tower , destroy the whole 102 storey building?
25. Are you doing any work while sleeping?
26. While walking ,our hands move in opposite directions. Why?
27. Why does a baby cry immediately after it comes out from mother's womb ?
28. What will be the impact on the environment if vehicles run on water ?
29. Why most of the children do not like to learn science and mathematics?(this question has been asked by 4 participants)
30. Why some people vomit while traveling in a car or bus ?
31. "Different types of soils are found in different places. Why ?
32. Why the shoot of a potted plant , when kept near the window, moves towards window only.
33. Why do liquids expand on heating?
34. Why is the shape of the earth round?
35. How smoking and chewing of tobacco damage our lungs?
36. Why do we feel sleepy after taking food?
37. Why do people wear dark glasses after an eye operation?
38. While sitting in a moving car during rainy reason, the rain appears falling obliquely. Why?
39. Light is a form of energy. Can it do work?
40. Two different materials are rubbed together and both get charged .while one is positive , other is negative. Can we predict which one will be positive ?

F. Evaluation :

Feed back forms (shown at page 135) were given to the teachers, which they filled up sincerely.

(a) About methods in classroom transaction to make learning student centred, collaborative, interactive, the teachers preferred the following:

Method	**Weightage %**
- Problem solving Questions	15
- Group activities with Hands-on Science	30
- Use of technology for Education in Classroom	20
- Lecture	35

(b) Comments/Suggestions offered by the teachers have been analysed as follows:

Majority suggested that they got a lot of new ideas. They felt excited while performing the experiments and getting results. Common feeling was in favour of

(i) extending the duration of training.
(ii) availability such science equipment, kit, OHP, Computer in each classroom of the school
(iii) holding such training programme frequently. Even BEd colleges did not give them such enjoyable learning experience. The experiments/ activities are wonderful and fantastic. In the classroom, teachers generally do not go beyond the textbook, that too without any Hand-on-Science.

(c) They evaluated the training programme as:

Outstanding	...	9 teachers
Very Good	...	7 teachers
Good	...	2 teachers

G. Recommendations

(a) Training of elementary teachers (Science) of the North East is a challenging task requiring application of modern ICT bedsides using face-to-face mode, as the number of untrained teachers in this region is very large.

(b) Key Resource Persons are to be trained in the face-to-face mode on the lines of the proceedings of this training programme by organizing series of such programmes. In the second phase these KRPs will replicate the proceedings at each training centre in states.

(c) NIE workshop, NCERT should organise such programmes in the North East frequently.

(d) As per CIET's letter to NERIE F03-04/05-06/CIET/MPD Pt File / 945 dt. 01.11.2006, sixteen centres in the NCERT – Edusat Network in the NE are yet to be activated due to sundry reasons like road permit, defects in equipment, etc. The distribution of the centres are

Assam – 7, Manipur – 2, Mizoram – 1, Mehalaya – 2,
Tripura – 1, Nagaland – 1, Sikkim – 1.
These centres need be activated immediately with all out effort from the CIET.

(e) NESAC (North East Space Application Centre) at Barapani has to be approached to open more receiving centres in addition to (d) with NERIE as the hub so that the training programme could reach to the remotest parts of the NE region.

Sample Evaluation Sheet from one participant

I. Teacher's Profile - Group V

(a) Name Smt. Wailamutlabiang Marwein (smt. W. Marwein)

(b) Academic Qualification **B.Sc. (C,B,Z) B.Ed.**

(c) Experience **13 years**

(d) Teaching Science / Maths / Others Science

(i) at primary / **elementary** / secondary level (s)

(ii) **for 7 (seven) years**

(iii) **at Nongkrem Govt. Upper Primary School** (name & address of school).

II. Methodology of teaching Science (in classroom) used by the teacher

(a) No. of children in your class **40 students**

(b) are equipment/apparatus available to you for teaching science?

Yes, Some are available

(c) Do you teach from the textbook only

Yes, but the topics which are not clear from the text book, I'll have to find reference books.

(d) Do you perform activities given in the textbook **Some activities**

(e) How do you interact with children in the classroom while transacting lessons?

(f) Do you allow them to ask questions? **Sometimes**

III. Teacher's assessment of this training programme

(a) how many experiements/activities your group could perform during these 5-days?

23 experiements

(b) name 3 (three) experiements done by you which you like most **Expt. on magnets, heat-conduction, Acquisition of charge by rubbing plastic strip, etc.**

(c) name 3 (three) problem solving questions that your group could coin

(i) **Is there any tree which has no branches?**

(ii) **Can we say that these are 8 (eight) planets in the solar system.**

(iii) **While walking on a bridge made of a single bamboo pole, if I look into water and not the bridge, what will happen?**

(d) List the areas, on order of priority, you have learnt to transact after going through this training programme

Lecturing, group activities, hands-on activities, using ET/ ohp during lecture, inviting problem solving questions from students, any other.

1. Group activities
2. using ET/ohp during lecture
3. Inviting Problem solving question from students
4. hand on activities
5. lecture

(Note: You've to mix these methods in some proportion)

(e) How will you organise your priority areas at 1, 2, 3 above in your classroom?

(1) Say 40 student is divided into 5 groups when every group should have a reporter to report their activities.

(2) With the help of computer or ohp, a teacher can store important point to be taught during lecture.

After lecturing a lesson, say, water I can ask the students whether the tap water is safe for drinking? Is water acidic or alkaline?

(f) You evaluation of this training programme.

Bad Good Very Good **Outstanding** (tick any one box)

(g) Comments/suggestions, if any: The training is very good but the period is very short. It is necessary to conduct such training every year for at least a period of one month. It is necessary that, your should request our state government to provide science kits to every school. It is high time that each and every school should have computer and projector (ohp) to strengthen teaching of Science and Mathematics.

H. List of Participants

S.No.	Name of Participants	School with Address
1.	Smt. D. Kynta	Agape School – Pomsohmen Cherra Punjee – 793108
2.	Smt. W. Marwein	Nongkrem Govt. UPS Shcool Nongkrem.
3.	Shri. H. Kharkamni	Mawphlang Govt. U. P. School Mawphlang
4.	Smt. A. Dey	Ist Meghalaya Police Battalian U.P.S. Mawiong
5.	Smt. B. Lyden	Sanmer U.P.S.
6.	Smt. D. Ranssiej	Tensets U.P.S.
7.	Shri. P. Lyngdoh	Kerlin U.P.S. Mawten
8.	Shri N. Nongseij	Longrin Govt. U.P.S. Wankaji
9.	Smt. M. Thongney	Indira Upper Primary School, Sohra.
10.	Shri. C. Wanniang	Mawsaw Govt. Uppper Primary School
11.	Shri D.E. Turnia	Little Star Upper Primary School, Mawkyrulat.
12.	Rina Karmakar	Arya Vidyalaya Upper School Jhaleepara
13.	Meme Manora Monghi	Green Field English School, Sohra.
14.	Smt. D. Lyngdoh	Govt. L.P.School Mawryng Knery
15.	Shri. C. S. Singh	Madan Laban Nepali U.P. School Shillong
16.	Shri S.K. Lyngkhoi	Mawsynram Gvot. U.P. School
17.	Shri D. Barua	B.V.N. Upper Primary School Forest Colony Shillong
18.	Smt. M. B. Warjri	Norngpathaw Secondary School, Nongpathaw Mawrich
19.	Shri Shariaw Sing Nongbri	Triot Singh Memorial Upper Primary School Mawkdok

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